

SvanPC++ software



SVANTEK



USER MANUAL

Ver. 1.0

www.svantek.com

TABLE OF CONTENTS

1	INTRODUCTION	3
1.1	MAIN FEATURES	3
1.2	REQUIREMENTS	3
1.3	ABOUT THIS MANUAL	3
2	SOFTWARE INSTALLATION	4
2.1	USB DRIVERS INSTALLATION	4
2.2	SVAN PC++ INSTALLATION	5
3	CONFIGURING INSTRUMENTS AND DOWNLOADING DATA	6
3.1	CONNECTION MODES	6
3.1.1	USB CONNECTION	6
3.1.2	RS232 CONNECTION	6
3.1.3	ADDITIONAL CONNECTION MODES	6
3.2	DATA TRANSFER	7
3.2.1	DOWNLOADING FILES FROM INSTRUMENT	7
3.2.2	SETTING REAL TIME CLOCK	8
3.2.3	MERGING FILES	8
3.3	SETUP FILE EDITOR	9
3.3.1	OPENING SETUP FILES	9
3.3.2	SETUP FILE EDITOR VIEW MODES	10
3.3.3	EDITING THE INSTRUMENT SETTINGS	12
3.3.4	MANAGING AND UPLOADING THE SETUP FILES	14
3.4	INSTRUMENT WIZARD	15
3.5	SVAN PC++ FILE TYPES	17
4	DATA VISUALISATION AND PLAYBACK	18
4.1	LOADING DATA AND BROWSING FILES	18
4.2	DATA VISUALISATION MODES	19
4.2.1	TABLE VIEW	19
4.2.2	PLOT VIEW	22
4.2.3	SPECTROGRAM VIEW	26
4.2.4	TEXT VIEW	28
4.3	DATA-SPECIFIC VIEW SUB-WINDOWS	29
4.3.1	OPENING VIEW SUB-WINDOWS	29
4.3.2	VIEW SUB-WINDOWS TYPES	31
4.3.3	ARRANGING THE WORKING AREA	37
4.4	VIEW CONFIGURATOR	39
4.5	PLAYBACK	41
4.5.1	EVENTS NAVIGATOR	42
4.5.2	WAVE NAVIGATOR	43
5	POST-PROCESSING AND DATA ANALYSIS	45
5.1	VIEWER MODULE POST-PROCESSING TOOLS	45
5.1.1	UNITS CONVERSION	45
5.1.2	ZOOM PLUS / MINUS TOOLS. AGGREGATION	46
5.1.3	MARKERS	47
5.1.4	ACCELERATION, VELOCITY AND DISPLACEMENT	53
5.1.5	SPECTRUM RECALCULATION	53
5.2	TOTAL RMS / LEQ AND CROSS-SPECTRA RECALCULATIONS	54
5.2.1	SVAN PC++ CALCULATOR TOOL	54
5.2.2	TOTAL RMS / LEQ	55
5.2.3	CROSS-SPECTRA	56
5.2.4	VIEWING CALCULATED RESULTS	56

6	DATA EXPORT	59
6.1	MS EXCEL	59
6.2	MS WORD	61
6.3	CSV FORMAT	63
6.4	ASCII EXPORT	65
6.5	AUDIO EXPORT	66
6.5.1	EXPORTING LOGGER EVENTS	66
6.5.2	EXPORTING WAVE FILES.....	67
6.6	USING THE CLIPBOARD	69
6.6.1	COPYING TABLE VIEW CONTENTS.....	69
6.6.2	COPYING TEXT VIEW CONTENTS.....	70
7	OTHER FEATURES	71
7.1	MAIN TOOLBAR CUSTOMISATION.....	71
7.2	SHORTCUT KEYS.....	75
7.3	ACCESSING ADDITIONAL MODULES	76
7.3.1	RC MODULE ACTIVATION	76
7.3.2	HARDWARE DONGLES	77
8	ENVIRONMENTAL MONITORING MODULE TOOLS	78
8.1	ENVIRONMENTAL CALCULATOR.....	78
8.1.1	SPECIFIC NOISE ASSESSMENT	78
8.1.2	GENERAL NOISE ASSESSMENT	80
8.1.3	VIBRATION MEASUREMENTS BASED CALCULATIONS.....	86
8.2	OTHER FEATURES	89
8.2.1	DATA MANAGEMENT WITH THE USE OF PROJECTS.....	89
8.2.2	USING MARKERS WITH ENVIRONMENTAL NOISE DATA.....	89
9	SVAN PC++ CALCULATOR TOOL	91
9.1	USING THE CALCULATOR DIALOG BOX	92
9.1.1	CHANNELS AND PROFILES	93
9.1.2	PARAMETERS.....	93
9.1.3	OPTIONS.....	94
9.2	SPECIFYING THE CALCULATION PERIODS	94
10	WORKING WITH SVAN PC++ PROJECTS	97
10.1	CREATING PROJECTS.....	97
10.2	USING THE PROJECT BROWSER.....	97
10.2.1	PROJECT OBJECTS	99
10.2.2	PROJECT VIEWS	101
10.2.3	PROJECT REPORTS	103
10.3	REPORTS TOOLBAR	106
10.4	REPORT TEMPLATES	109
10.4.1	CREATING TEMPLATES	109
10.4.2	EDITING TEMPLATES	109
10.4.3	GENERATING REPORTS FROM TEMPLATES	112
10.5	DATA SEARCH TOOL.....	113
10.5.1	TAGS.....	113
10.5.2	PERFORMING DATA SEARCH	116
	INDEX.....	119

1 INTRODUCTION

SvanPC++ software is dedicated for SVAN 95x/97x and SV 10x instruments series. However, it can be also used with old SVAN 94x instrument series if the most recent firmware version is installed in particular instrument.

The SvanPC++ program is a sophisticated tool which extends the functionality of the mentioned instrument series. The SvanPC++ base module is available for all users free of charge. Other modules (e.g. REMOTE COMMUNICATION, BUILDING ACOUSTICS) are optional and have to be purchased.

1.1 MAIN FEATURES

- Downloading measurement results from instruments to PC
- Data files storage and management in project documents
- Visualisation of data and instrument settings during measurements
- Adjusting the instrument settings (wizard and editor modes)
- Easy direct data export to commonly used applications
- Data post-processing (e.g. spectra comparison, time-history recalculation)
- Support for all new SVAN instruments
- RS 232 and USB interfaces compatible

1.2 REQUIREMENTS

- MS Windows 2000 / XP / VISTA / 7

1.3 ABOUT THIS MANUAL

This manual's structure is designed to show the ways of using the software to:

1. connect and configure Svan instruments,
2. download measurement data,
3. visualise data and playback,
4. post-process and analyse data,
5. data export for reporting.

The newest version of this manual in PDF format is available to download on the Svantek website – www.svantek.com.

Further information on the SvanPC++ program can be found in the HTML version of the help, available after pressing the F1 button. The structure of the HTML help corresponds to the structure of the program, with detailed descriptions of particular elements of the SvanPC++ graphical user interface, such as menus, dialog boxes etc.

2 SOFTWARE INSTALLATION

2.1 USB DRIVERS INSTALLATION

USB drivers installation package can be found at the CD received on purchase of an instrument or it can be downloaded from www.svanteke.com (path: SUPPORT - DRIVERS / SOFTWARE - USB DRIVERS). Please follow the installation instructions. To complete the USB drivers installation user should connect the instrument after system reboot and select automatic USB driver installation. It may be necessary to repeat the last step for all USB ports.

IMPORTANT: Installation of USB drivers requires the user to have administrator privileges.



2.2 SVAN PC++ INSTALLATION

SvanPC++ software installation can be initiated using provided CD or by downloading the installer file from www.svantek.com (path: PRODUCTS / SOFTWARE / SvanPC++). Please follow the installation instructions.

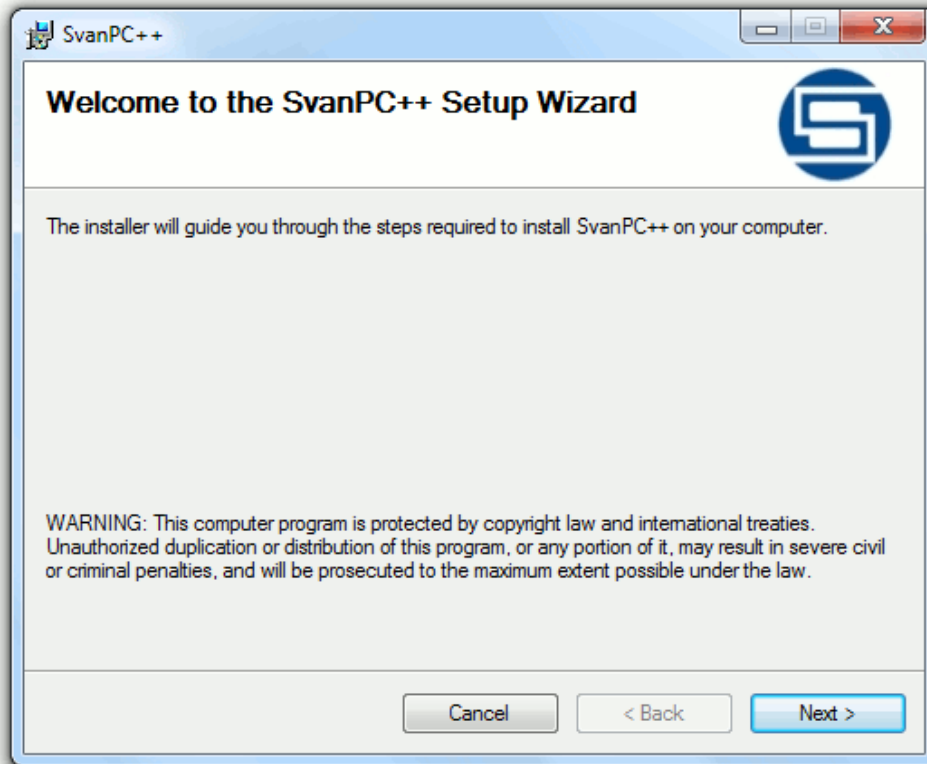


Fig.2.1. SvanPC++ software installer.

You will be asked whether to install SvanPC++ for yourself, or for anyone who uses this computer. The choice determines the area in which SvanPC++ settings and shortcuts are stored and hence its availability to users sharing the workstation.

3 CONFIGURING INSTRUMENTS AND DOWNLOADING DATA

3.1 CONNECTION MODES

SvanPC++ supports USB and RS232 interfaces for direct communication. Configuration of each interface is different.

More remote communication modes are supported as an optional feature, available after purchasing the relevant SvanPC++ module (*RC Module*).

3.1.1 USB CONNECTION

Using the USB interface requires appropriate drivers being installed (see Chapter 2.1.: *USB Drivers Installation*). SvanPC++ will automatically detect instruments plugged-in by USB.

3.1.2 RS232 CONNECTION

Configuration of RS232 interface can be done using the *RS232 Settings* command from *SVAN* menu. This will activate the *RS232 Settings dialog box*. It enables to configure the connection parameters and options.

Note: *Baud Rate* must be the same in the SvanPC++ application and in the instrument.

After setting RS232 options press the *OK* button to save changes, *Cancel* to discard changes or *Default* to set default values for each parameter.

When you attempt to connect a SVAN device to your computer via Bluetooth, two new COM ports will appear. To successfully communicate with the instrument, you have to select the **output** port.

3.1.3 ADDITIONAL CONNECTION MODES

To communicate with instruments using GPRS and Internet connection, you have to purchase the SvanPC++ Remote Communication Module. Multiple advanced tools for data acquisition are also provided with this module.

3.2 DATA TRANSFER

3.2.1 DOWNLOADING FILES FROM INSTRUMENT

To download data from a SVAN instrument using SvanPC++ software, you have to do the following:

1. Connect the instrument to the PC.
2. Switch on the instrument.
3. Launch SvanPC++.
4. Manage the files transfer with the use of the *SVAN Files* dialog box.

The *SVAN Files* dialog box can be opened through the Instrument Wizard (see Chapter 3.4.: *Instrument Wizard*). You can also use the *SVAN Files* command in the *SVAN* menu or press the  button on the Toolbar.

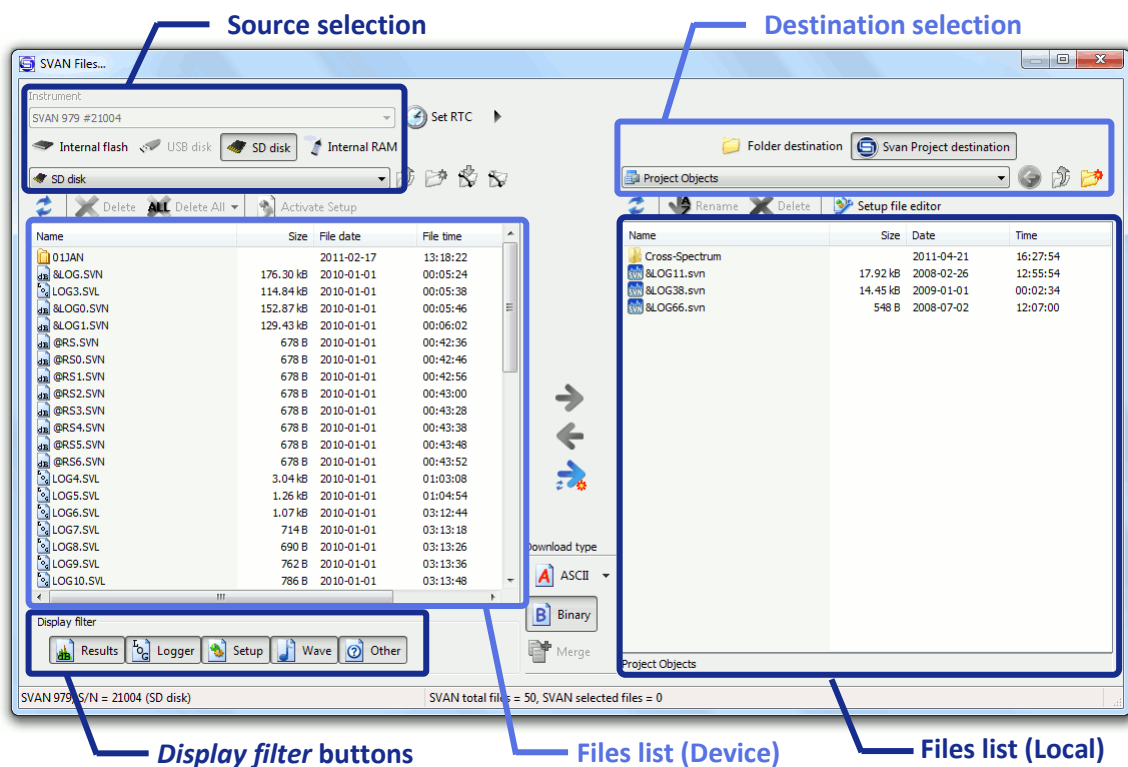


Fig.3.1. *SVAN Files* dialog box.

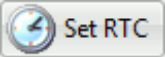
To download files in the *SVAN Files* dialog box, you have to do the following:

- Select the device from which you want to download files (if multiple devices are connected), as well as the memory type and sub-catalogue used as the source (if multiple sources are supported).
- Select the transfer destination (a local PC / LAN folder or a Svan Project file) and the local destination folder.
- Select the files to download from the device's files list and copy them to the target location using the  button, or copy only the new files using the  button.

You can use the *Results*, *Logger*, *Setup*, *Wave* and *Other* buttons in the *Display filter* panel to choose the file types to be displayed on the lists.

The *SVAN Files* dialog box is presented in Fig.3.1. More detailed information on how to use this dialog box can be found in the SvanPC++ HTML help (path: *Dialog boxes and sub-windows / SVAN Files dialog box*).

3.2.2 SETTING REAL TIME CLOCK

In order to set the Real Time Clock in the instrument the user has to click on the  button. The current date and time will be transferred from PC to the connected instrument. "RTC updated" message will appear on the screen.

It is also possible to manually set date and time. To do so, press the arrow button next to the *Set RTC* button and enter the date and time in the *Customize RTC* dialog box.

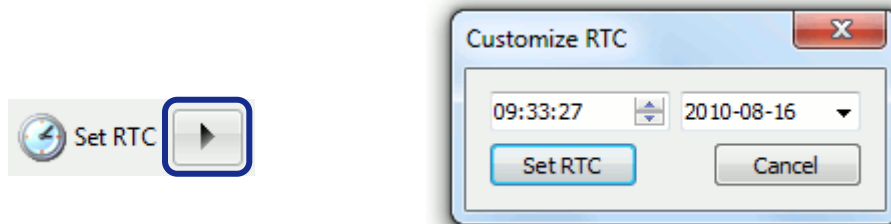


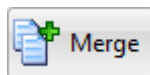
Fig.3.2. *Customize RTC* button and dialog box.

3.2.3 MERGING FILES

Merging files means creating one file (called *multifile*) from multiple measurement results files. The merging is usually performed on results of measurements in different time moments, leading to a file containing a finite range of the time domain, analogous to a *Logger* results file.

You can merge files when downloading them from measurer in the *SVAN Files* dialog box. To do so, the following actions are necessary:

- Select the files you wish to merge on the device's files list.



- Toggle the *Merge* button in the *Download type* panel.



- Press the *Download selected files* button.

Files created as an effect of merging downloaded measurement results are automatically given a name of *Multifile (1)*, *Multifile (2)* etc.

Note: Only *result* files can be merged. The measurement settings for merged files have to match. However, integration period and calibration factors values may be ignored while merging, according to settings in the *Main Options* dialog box (path: *Tools / Main Options / Multifiles*). In case settings in merged files do not match, an additional list will appear on the files list toolbar where the files with various settings are grouped and can be browsed, as shown in Fig.3.3.

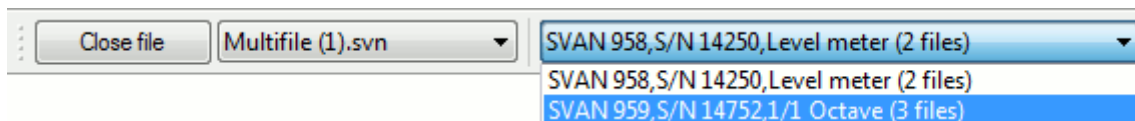


Fig.3.3. Files list toolbar containing groups of files in a multifile with different measurement settings.

It is also possible to merge files which are already downloaded. For merging files in a local directory, you have to do the following:

- Open the files you wish to merge with the use of the *File open* dialog box (activated with the  button on the toolbar or with the *Open* command from the *File* menu).
- When multiple files are selected to open, the *Multiple Selection* dialog box will appear. To create a multifile, press *Merge*.

Note: The *Merge & Open option* has the same effect as *Merge*, but the created multifile will be also automatically opened in SvanPC++.

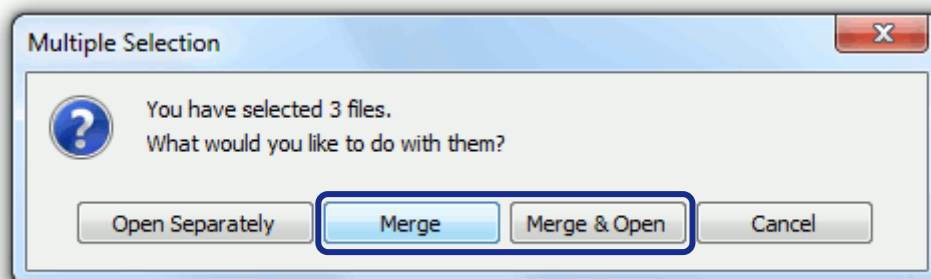


Fig.3.4. Merging files in the *Multiple Selection* dialog box

3.3 SETUP FILE EDITOR

The *Setup File Editor* is a SvanPC++ extension that gives its users an easy access to SVAN instruments' setup files. Thanks to the clear visualization, similar to the menu displayed by the instruments, the user may configure the instruments' settings in a quick and efficient way and upload them to the instrument. The configured settings can be saved in external .svt files for a possible future reference.

3.3.1 OPENING SETUP FILES

The *Setup File Editor* works in the section of SvanPC++ responsible for the communication between the instrument and computer. The program uses

setup files that can already be found in the instrument. That is why before any modification is done to a setup file, it needs to be downloaded first. For details on downloading files from the instrument, see Chapter 3.2.: *Data Transfer*.

In order to edit a setup file (.svt), you need to select it in the files list of the *SVAN Files* dialog box and press the *Setup file editor* button, located in the top right corner of the window, as shown in Fig.3.5. You can also double click on a setup file. In this case, a temporary file on a local drive will be first created, and then opened in the Setup file editor.

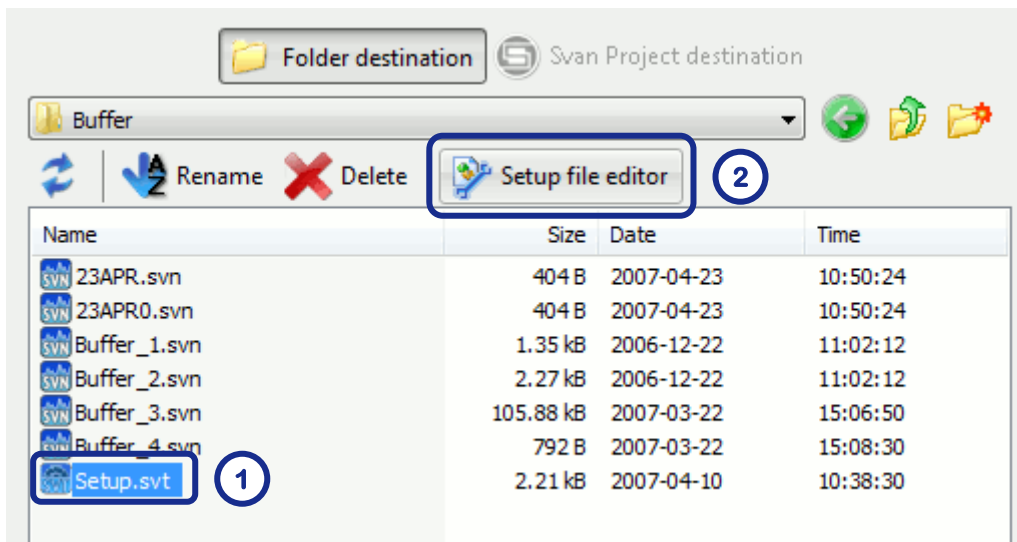


Fig.3.5. Opening .svt files with the Setup file editor.

The file format is automatically checked during opening. In case of incompatibility, an error will be reported. Otherwise a new window will be opened, containing the SVAN instrument's settings in a configuration similar to its internal menu structures.

3.3.2 SETUP FILE EDITOR VIEW MODES

In the Setup file editor, you can choose one of three view modes – *Tree*, *List* and *Wizards* View. To select the most convenient, press the corresponding button.

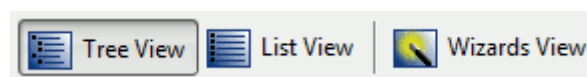


Fig.3.6. Setup file editor view modes buttons.

The default, *Tree View*, is presented in Fig.3.7. It offers the settings arranged in a form of a tree, resembling settings structure in SVAN instruments. Names in capitals only denote menu tabs, while the others – particular settings. The settings are sorted in accordance to menu structures accessible through display panels of the instrument.

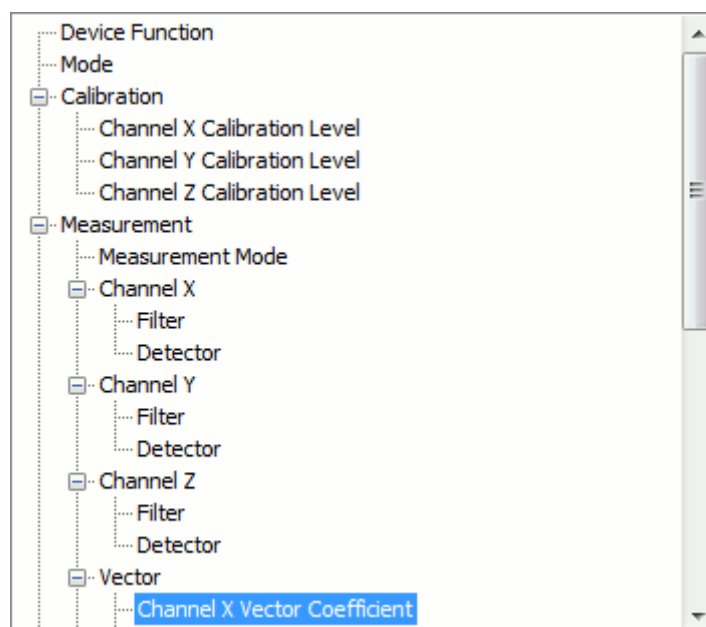


Fig.3.7. Instrument settings presented in *Tree View* in the Setup file editor.

The *List View* is presented in Fig.3.8. It shows settings (and only settings, not menu tabs) in the form of a list, containing names of the settings and their current values. The settings are sorted in alphabetical order and any changes made to the settings are automatically updated in the list.

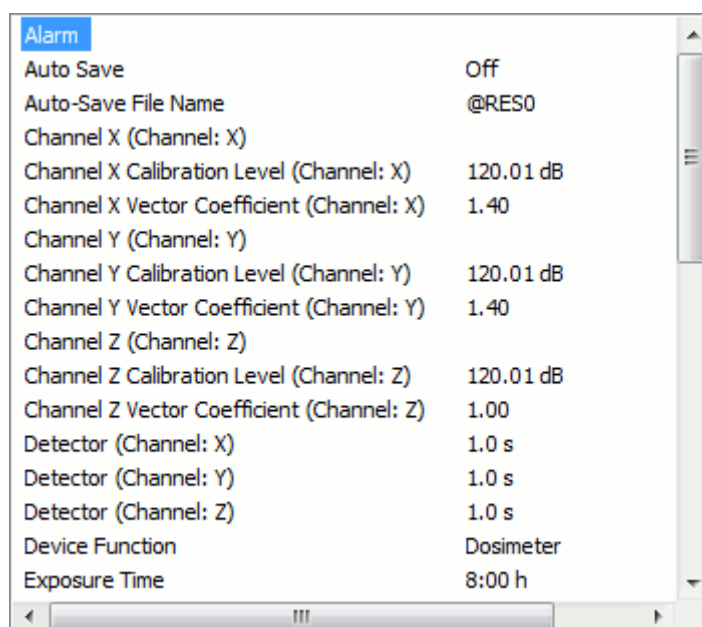


Fig.3.8. Instrument settings presented in *List View* in the Setup file editor.

The *Wizards View* contains a list of general areas of the instrument settings that can be customized, as presented in Fig.3.9. It enables to configure the instrument settings in a simplified way. To do so, select the area you wish to customize (e.g. Auto-Save, Basic Settings) and follow the steps supported by the program. The *Cancel Wizard* button enables to quit the current Wizard without applying the changes made with it.

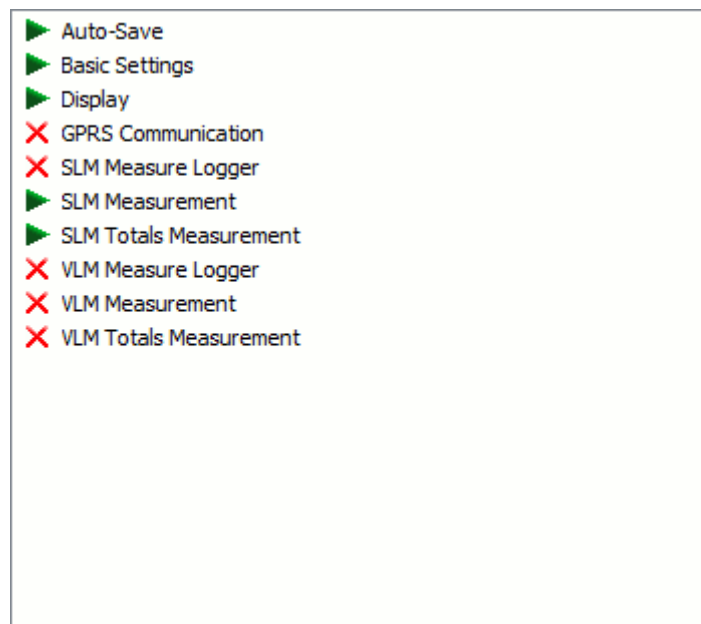


Fig.3.9. Instrument settings presented in *Wizards View* in the Setup file editor.

3.3.3 EDITING THE INSTRUMENT SETTINGS

By selecting a particular setting in any of the three view modes (e.g. Measurement Mode), the user gains the access to a related group of controls visible in the top right corner of the window (Fig.3.10). These controls enable viewing and editing the selected setting.

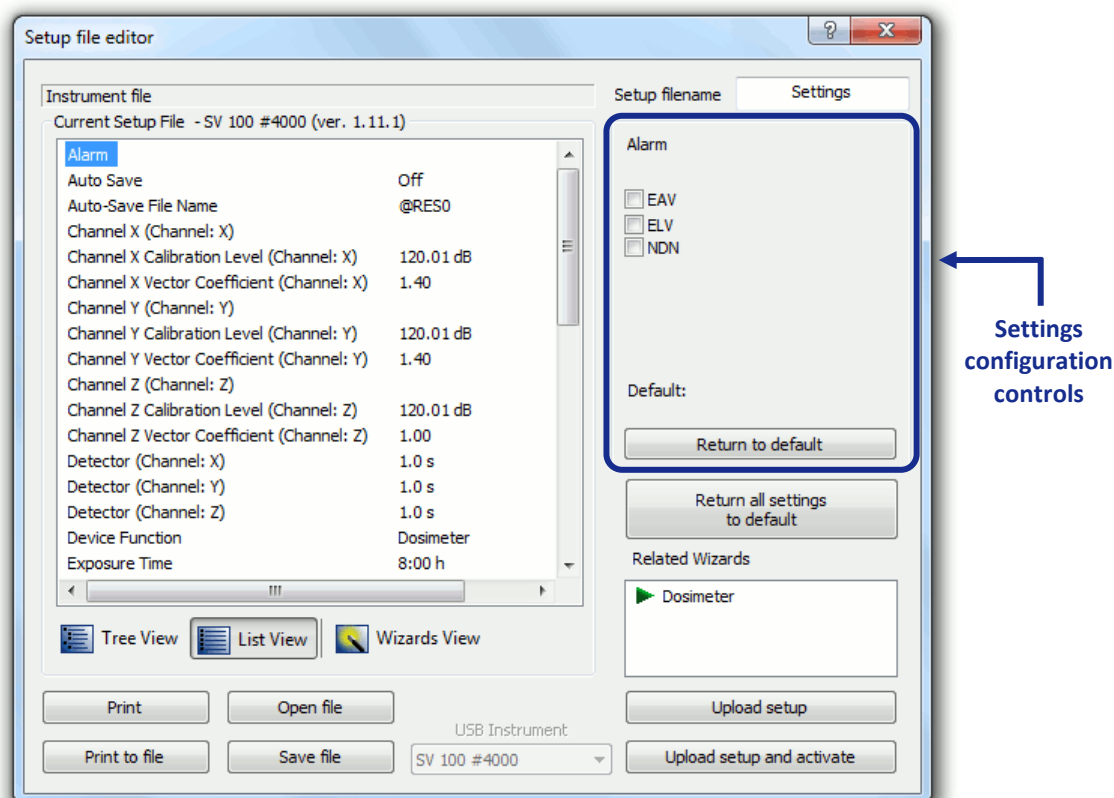


Fig.3.10. Controls for viewing and editing the instrument settings in the Setup file editor (here: *check-box*-type controls)

Depending on the selected setting following controls are available:

- *text control* – permits editing settings that contain a plain text – user inputs the setting value directly from keyboard (e.g. *Server Address* or *SMS Text* for *Wireless Communication*)
- *scrollable combo box* - user modifies the setting value by selecting the desired option from a list supported by the instrument (e.g. *Measurement Mode* or *Integration Time*).
- *check-boxes* – ticking the checkbox activates or deactivates the function (e.g. *Logger results*).

Some settings are related to each other. It means that one works only when the other is set to a certain value.

For example, the *Auto Save* option is available only if *Integration Time* value is equal or bigger than 10 seconds (unless the repetition cycle is equal to 1). If settings of related options are not corresponding, the setup is not available for editing. In the mentioned example, the *Auto Save* will not be possible to edit if the *Integration Time* is set to 9 seconds or less.

When lack of correspondence occurs, the editor asks for confirmation. When user chooses to continue the change in spite of the incorrespondence the related setting will be set to a value which will not cause any discrepancy (default).

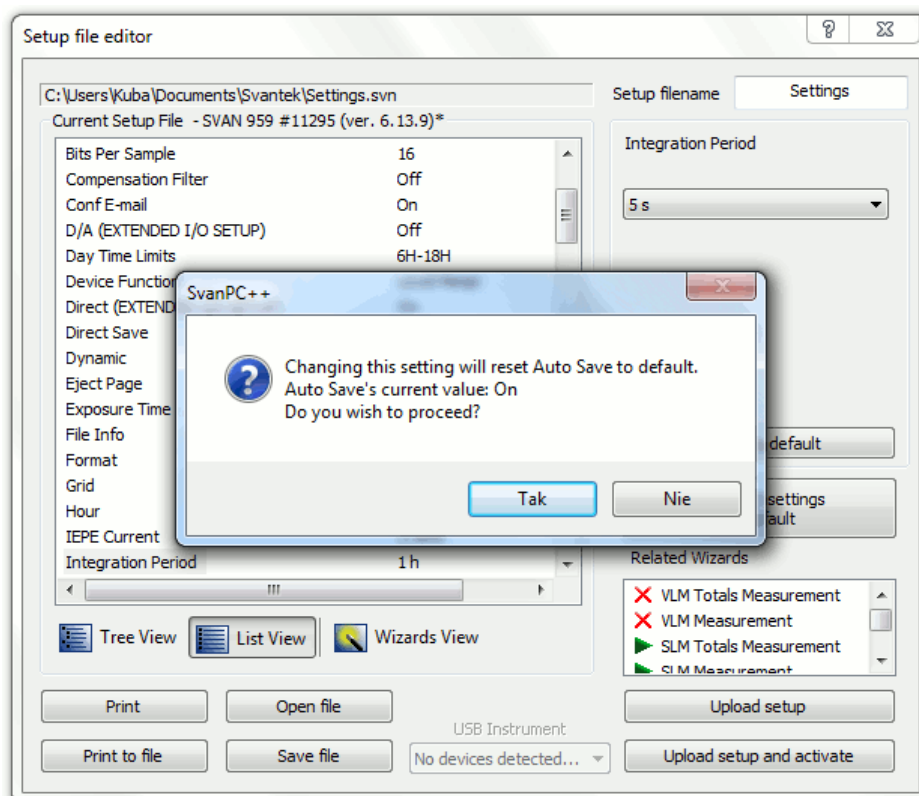


Fig.3.11. Confirmation box – the user has selected to change *Integration Time* to 5 seconds, while *Auto Save* is set to *ON*.

In our example, during any attempt to change the *Integration Time* to a value lower than 10 seconds when *Auto Save* is on, the module will ask for confirmation. If user proceeds, the *Auto Save* function will be switched off.

3.3.4 MANAGING AND UPLOADING THE SETUP FILES

The *Setup filename* field, located in the top right corner of the window, allows to change the original filename. This filename is the one seen by the device after the file is uploaded to its internal flash memory. Changing this filename allows to store numerous setup files in the device with different filenames.

Note: Uploading a setup file with a filename which already exists will overwrite the old setup file. The filename is limited to 8 characters.

Buttons, placed in the bottom of the window, are responsible for the file management:

- *Print* and *Print to file* – allow the user to output the data into either printer or a text file. For both of these options, the data will be arranged in a way similar to the *List View*, alphabetically, with corresponding values right next to it. The list will have an added label with the type of the instrument for which the setup file has been prepared for. Finally, the data will be sent to either printer (through Printer dialog) or written into selected file in simple text format.
- *Open file* – loads a selected local file to the Setup file editor, allowing the user to modify it.
- *Save file* – saves the currently opened setup file to a selected local file.
- *Upload setup* – clicking this button will upload the file with current settings to the connected Svan instrument.
- *Upload setup and activate* – clicking this button triggers a similar procedure as above, but additionally sends to the instrument a command to load the settings from the uploaded file.

During the upload, the device type and software version are compared with the file's information and any incompatibilities are reported. If the uploaded file's software version is different from the instrument's, the Setup file editor will offer either aborting or upgrading (or downgrading) the file to the format accepted by the device.

If multiple devices are connected, the selector in the bottom of the window enables to choose the device for the upload.

3.4 INSTRUMENT WIZARD

The *Instrument Wizard* provides an easy access to various features of SvanPC++, concerning a connected device.

It is opened automatically every time when the software detects connection with a Svan instrument for which the Wizard is available. Instruments supported with the *Instrument Wizard* are:

- SV 100/101
- SV 102
- SV 106
- SVAN 95x
- SVAN 979

Note: To disable the automatic opening of the *Instrument wizard*, uncheck the *Show wizard when connecting an instrument* control via *Main options / Instrument autodetection*.

You can also manually show / hide the *Instrument Wizard* window, using the *Instrument Wizard* command in the *View* menu or the  icon on the Toolbar.

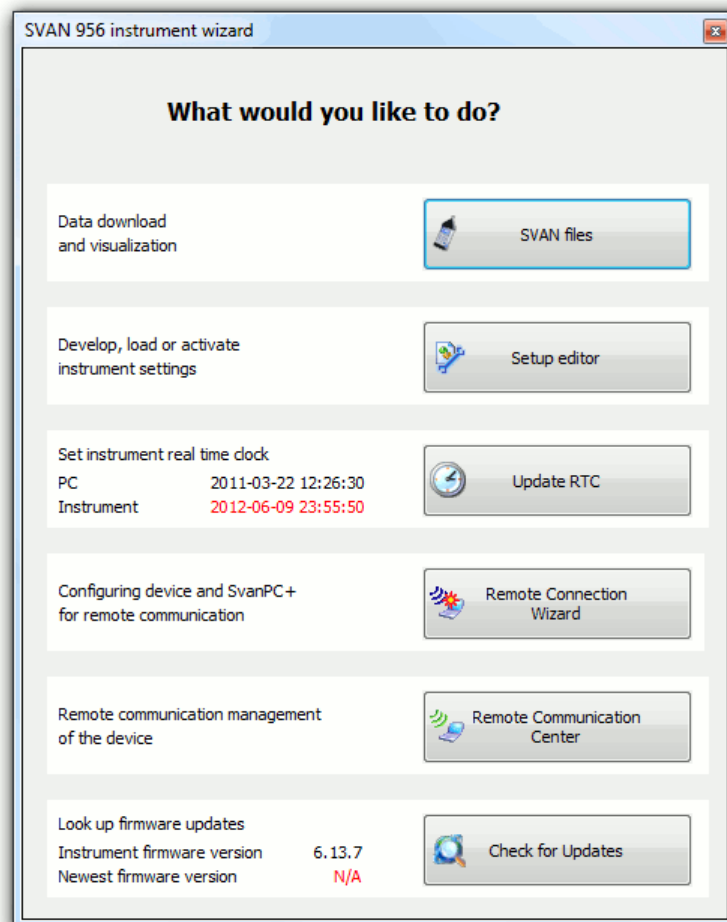


Fig.3.12. The *Instrument Wizard* dialog box for SVAN 956.

Depending on the instrument connected, there are various buttons available in the *Instrument Wizard* window, as listed in Table 3.1.

Table 3.1. Buttons available in the *Instrument Wizard*.

<i>Button</i>	<i>Function</i>
 Update RTC	– synchronizes the connected instrument's real time clock with the real time on the PC.
 Calibration	– opens the <i>SV100/101</i> Calibration dialog box.
 Check for Updates	– compares the firmware version installed on the device with the latest version available.
 Options / functions	– opens the <i>SV100/101 Options configurator</i> window.
 Remote Communication Center	– opens the <i>Remote Communication Center</i> window.
 Remote Connection Wizard	– opens the <i>Connection configuration wizard</i> window.
 Setup editor	– opens the <i>Setup file editor</i> window.
 SVAN files	– opens the <i>SVAN Files</i> dialog box.

Note: The *Check for Updates* button serves only to search for newer versions of firmware. However, it is not possible to download new firmware using the *Instrument Wizard*.

For more information on the *Instrument wizard*, please refer to SV 100 / 102 or other relevant instrument's quick start guide available on the SVANTEK Website: www.svantek.com.

3.5 SVAN PC++ FILE TYPES

Since the release of the SV 979 measurer, files downloaded from the Svan instruments may have various extensions in order to achieve a better distinction of the file contents.

All SvanPC++ file types are listed in Table 3.2.

Table 3.2. SvanPC++ file types.

<i>Icon</i>	<i>Extension</i>	<i>Description</i>
	.svn	– Files created in devices older than SV 979 and multifiles generated with the use of the SvanPC+X software.
	.svl	– Logger files.
	.svt	– Instruments' setup files.
	.svr	– Results files.
	.svs	– Station wizard settings (RC) files.
	.srt	– Real-time analysis results files.
–	.sts	– SvanPC+X software settings files.
	.svp	– Svan Project files.

4 DATA VISUALISATION AND PLAYBACK

The base module of the SvanPC++ software suite – *Viewer* – enables to visualise the measurement results downloaded from the Svan instruments.

4.1 LOADING DATA AND BROWSING FILES

After downloading a data file (see Chapter 3.2.1.: *Downloading Files from Instrument*) you can open it directly from the *SVAN Files* dialog box by simply clicking twice on its name in the files list. This will cause the *SVAN Files* dialog box to close and the selected file will be opened in the *Viewer* module.

It is also possible to open files downloaded earlier, which are stored in the PC. To do so, press the  button or use the *Open* command from the *File* menu and find the desired file using the *File open* dialog box.

It is possible to open multiple files in the *Viewer* module simultaneously. To choose between the opened files you can use the *Files list toolbar*, located in the top-left corner of the SvanPC++ window, below the Main toolbar.

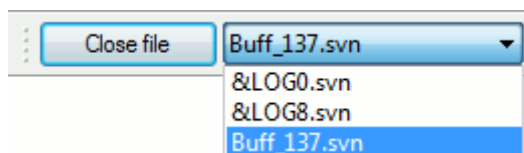


Fig.4.1. Files list toolbar.

- To expand the list of currently opened files, click on the ▼ mark.
- To select the file you wish to work with, click on its name on the list.
- To close a file, select its name on the list and press the *Close file* button.

You can decide whether to show or hide the Files list toolbar, using the *Files List* command in the *View* menu. It is also possible to change the location of the Files list toolbar. To do so, click somewhere in its area with the left mouse button and drag it without releasing to the desired location.

4.2 DATA VISUALISATION MODES

The SvanPC++ *Viewer* module enables to visualise the data in one of four different modes:

- *Table View*,
- *Plot View*,
- *Spectrogram View*,
- *Text View*.

You can choose between different view modes to find an optimal form for reading and analysing data. To switch the views, you should use the corresponding buttons on the Main toolbar or the corresponding commands in the *View* menu, as shown in Fig.4.2.

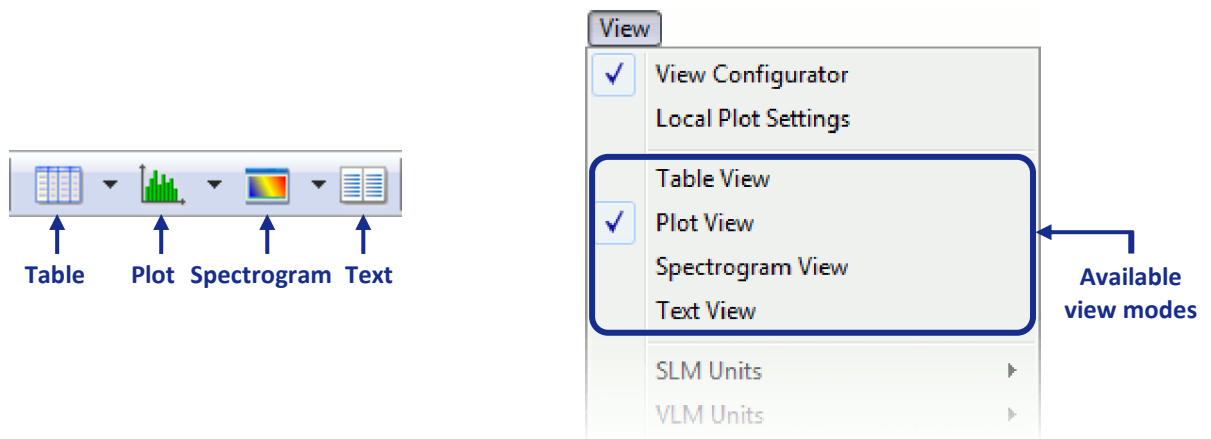


Fig.4.2. Controls for switching the view modes in the Main toolbar (left) and in the *View* menu (right).

The availability of the view modes depends on the type of currently active data. For example, *Header information* data can be only viewed in the *Table* or *Text* mode, while results of measurements in the time domain can be viewed as a *Table* or *Plot*, but neither can be presented as a *Spectrogram*. If a view form is available for the currently active data, its icon is drawn in colors instead of grayscale.

Each of the view modes has its own tools which serve to customise the way data is displayed in order to achieve a desired form of visualisation. Features concerning particular view modes are described in Chapters 4.2.1 – 4.2.4.

4.2.1 TABLE VIEW

In the *Table View*, numeric and text data are displayed in separate cells, identified by rows and columns. This mode is used for viewing the *Header information* as well as measurement results such as *Main results*, *Statistics*, *Logger results* etc. in numeric form.

Modena_3: Logger 1/3 Octave						
No	Date & time	Ch1 (VLM)	Ch1 (VLM)	Ch1 (VLM)	Ch1 (VLM)	Marker
		1/3 Octave Acc RMS [dB]	1/3 Octave Acc ...	1/3 Octave Acc ...	1/3 Octave Acc ...	
		0.800 Hz	1.00 Hz	1.25 Hz	1.60 Hz	
1	2008-02-14 00:39:26.100	22.6	22.6	22.6	68.5	1
2	2008-02-14 00:39:26.200	22.6	22.6	22.6	68.5	1
3	2008-02-14 00:39:26.300	22.6	22.6	22.6	59.4	1
4	2008-02-14 00:39:26.400	62.8	55.4	61.4	66.0	1
5	2008-02-14 00:39:26.500	62.8	55.4	61.4	66.0	1
6	2008-02-14 00:39:26.600	62.8	55.4	61.4	65.6	1
7	2008-02-14 00:39:26.700	60.0	63.3	46.4	65.6	1
8	2008-02-14 00:39:26.800	60.0	63.3	46.4	60.7	1
9	2008-02-14 00:39:26.900	60.0	63.3	46.4	60.7	1
10	2008-02-14 00:39:27.000	63.6	60.4	59.9	67.9	1
11	2008-02-14 00:39:27.100	63.6	60.4	59.9	37.7	1
12	2008-02-14 00:39:27.200	63.6	60.4	59.9	37.7	1
13	2008-02-14 00:39:27.300	63.6	60.4	59.9	68.5	1
14	2008-02-14 00:39:27.400	59.7	39.6	66.1	68.5	1

Fig.4.3. An example of the *Table View*.

Normal / Transposed view

In general, when the *Normal view* is set, the table rows contain different time samples while columns contain results of different measurements or calculations. Switching to the *Transposed view* sets the inverse configuration. The *Transposed view* is particularly useful if you need to view many variables in few points of time.

To enable the *Transposed view* you can do one of the following:

- Click on the  button.
- Use the *Table view* pulldown menu, available from the Main toolbar.
- Use the *Table view* command from the *View* menu.

Copying with headers

The *Copy with headers* tool is available via *Edit* menu or from the pulldown menu opened by clicking with the right mouse button. It copies the selected data to the clipboard together with describing it headers from above and left-hand side of the selection.

Cell types

There are different types of cells in the table:

- Cells with gray background contain headers, describing the current data, which will be copied when you use the *Copy with headers* tool.
- Cells with yellow background also contain descriptions for the data values, but they are not copied by the *Copy with headers* tool.
- Cells with white background contain the data values.

Adjusting the view

To configure the way data is displayed in the *Table view*, you can use the following buttons, available on the Main Toolbar:



Table Font Size – Sets the size of the text displayed in the table.



AutoSize Columns – Sets the column widths equal the longest text string.

Configuration of the *Table view* settings is also available in the *Table View* tab of the *Main Options* dialog box. You can open the *Main Options* dialog box using the  button on the Main toolbar or the *Main Options* command from the *Tools* menu. This tab is composed of 3 panels:

- The *Font and colors* panel enables to configure the way text is displayed in the *Table view*. To select the text font press the *Choose* button. A font selection window will appear, allowing to set the font you prefer. To select the text color, press the color button. A color choice window will appear allowing to select the preferred color.
- The *Display* panel enables to configure the way functions are displayed in the *Table view* when viewing multiple functions of different steps. The *continuously repeating values* option causes the fields where the values are not defined, because a function has a greater step than other displayed functions, to be filled with the last available value. The *show single value at start time of greater step* option causes to display values only at the beginning of a greater step, leaving the other fields empty.
- The *Marker set of values* panel enables to configure the way markers are displayed in the *Table view*. Markers contain ranges of the time domain specified by the user or created automatically. They can be displayed in the *Table view* as a function. You can select the value displayed in the table corresponding to data contained / not contained in the marker (*Existence value / Not existence value*).

Limiting the time domain

The *Limit time domain to* tool enables to display only a limited range of the time domain, specified by a selected function or marker. In order to enable this option, you have to select the desired function / marker in the *View configurator* and press the *Limit time domain* button. In order to remove the limit, press the *Clear time domain limit* button.

In Fig.4.4 the time domain is limited to the range of *Marker 1*. More detailed information about the *View configurator* can be found in Chapter 4.4.: *View configurator*.

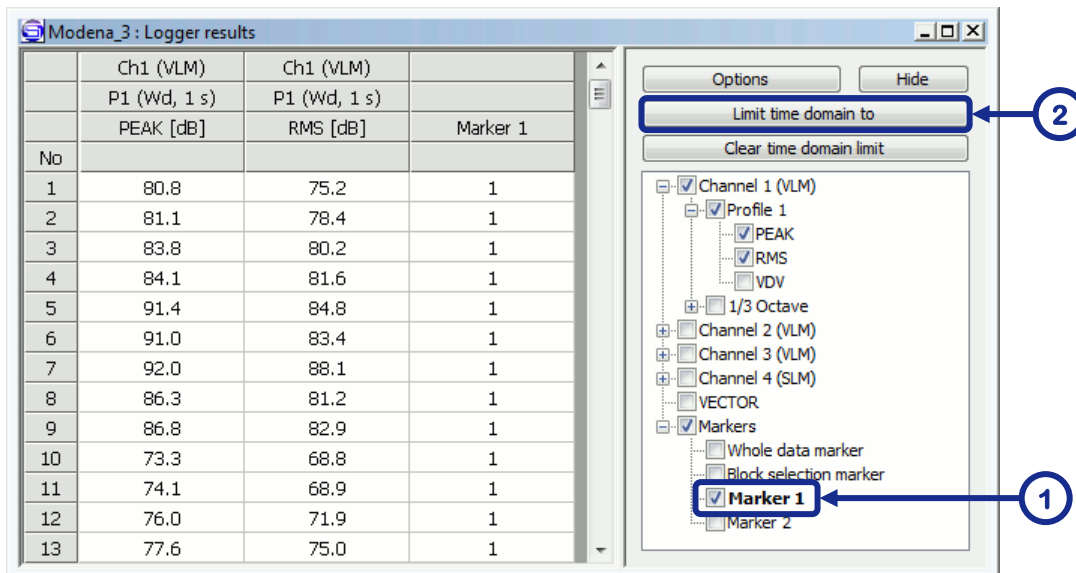


Fig.4.4. Limiting the time domain.

4.2.2 PLOT VIEW

In the *Plot view*, parameters measured in the time or frequency domain, such as e.g. *Logger results* or *1/3 Octave*, are presented in the form of a 2D plot.

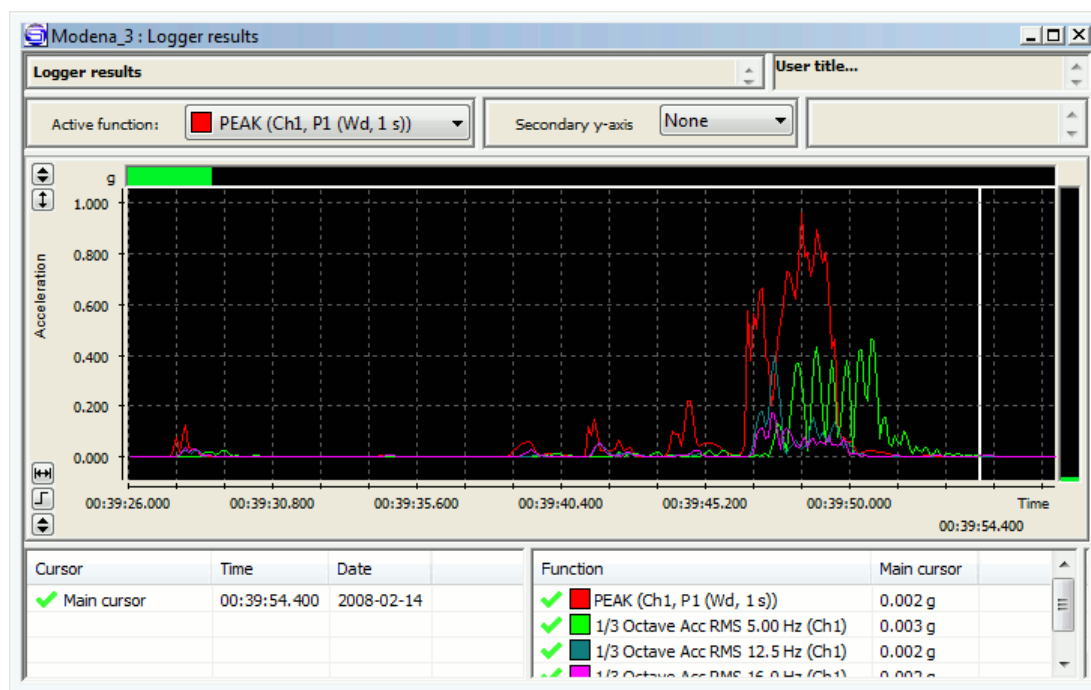


Fig.4.5. An example of the *Plot view*.

Window configuration

The *Plot view* window is composed of 3 parts (Fig.4.6):

- Central part – the plot together with the axes and additional controls,
- Upper part – a table containing information about the active function, the secondary y-axis etc.,

- Lower part – a table containing the positions of cursors and selections as well as a list of results of measurements and calculations.

You can show or hide the particular parts, using the  buttons, located at the left side of the window. You can also use the *Plot view* pulldown menu or press the  button to switch between 3 available modes:

- *Normal* – all parts visible;
- *Data and results* – upper part hidden;
- *Only data* – only the middle part visible.

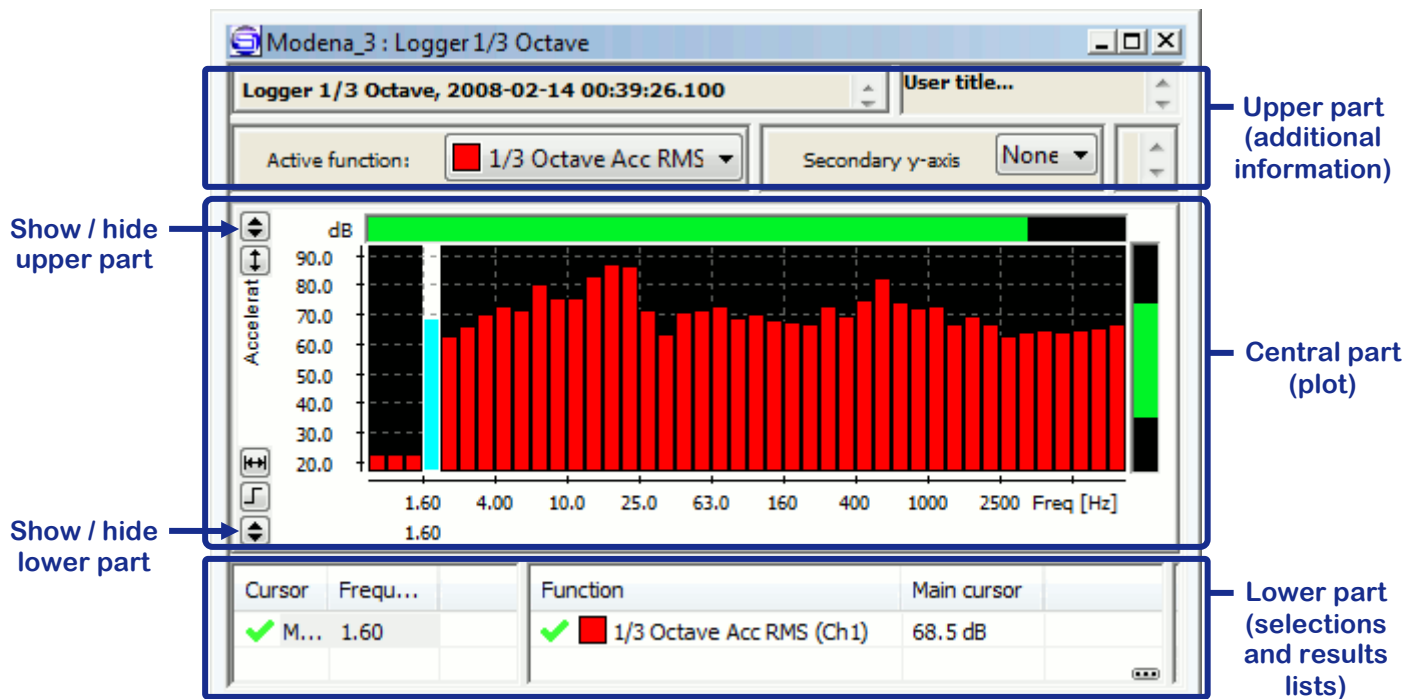


Fig.4.6. Parts of the *Plot view* window.

Viewing the plot

In the *Plot view*, the horizontal and vertical axis can easily be scrolled and scaled. To scroll an axis, you can:

- use the green slider, or
- click with the left mouse button on the axis and move the mouse without releasing.

To scale an axis, click on it with the right mouse button and move the mouse without releasing.

Axis auto scaling

The *Y-axis auto scaling* tool serves to automatically scale the y-axis to make the function values fill the plot area. To enable the *Y-axis auto scaling*, use the  /  buttons, located at the left-hand side of the *Plot view* window.

Analogously, the *X-axis auto scaling* tool serves to automatically increase or decrease the number of pixels per sample to make all samples visible in the

whole plot area. To enable the *X-axis auto scaling*, use the  /  buttons, located at the left-hand side of the *Plot view* window.

Note: If you scroll or scale an axis when the corresponding *auto-scaling* tool is enabled, it will be automatically disabled.

Adjusting the view

You can specify the way functions are drawn on the plot using the *Drawing mode* buttons  /  /  located on the left side of the window.

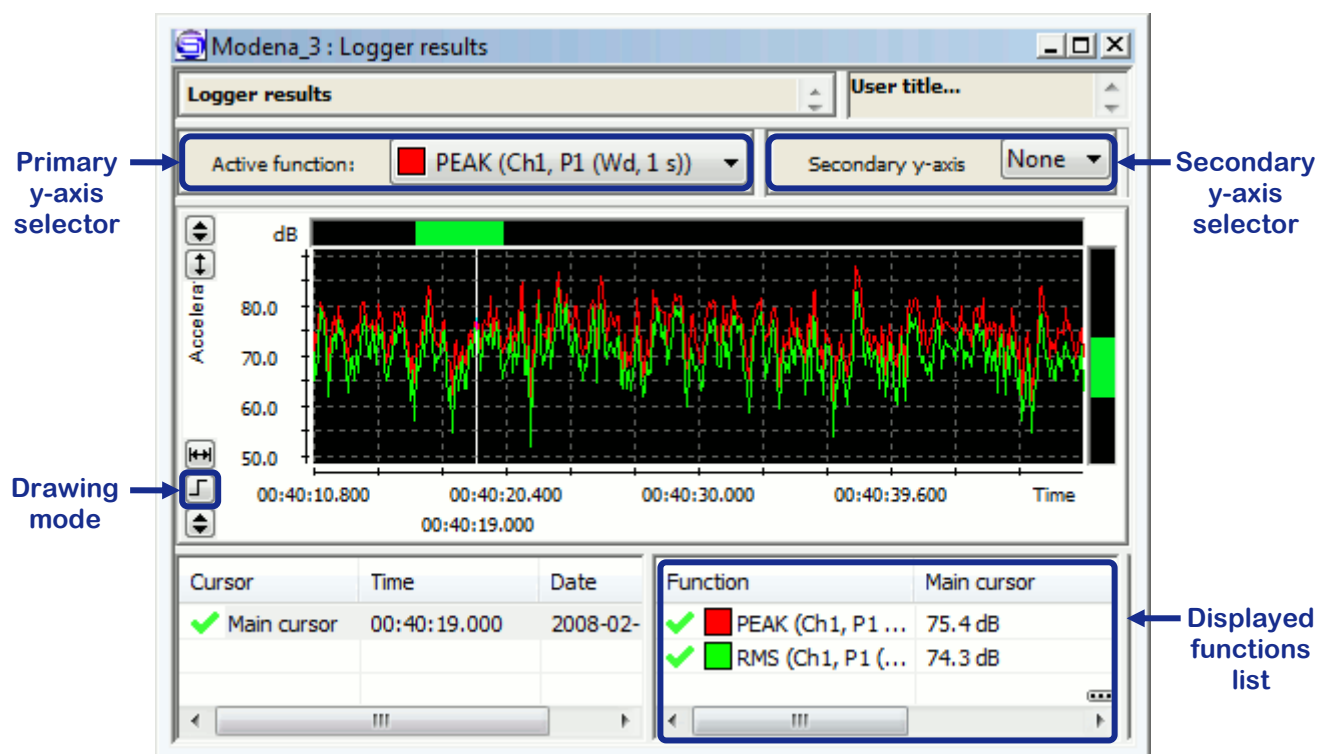


Fig.4.7. Controls for adjusting the view in the *Plot view* window.

All the functions displayed on the plot are listed in the table in the lower part of the *Plot view* window. Clicking on a function name in the list will highlight its plot in the plot area, so you can easily recognize it when many functions are plotted at once.

You can choose the currently active function, used to define the primary y-axis, as well as the parameter to be represented on the secondary y-axis, using the *Active function selector* and the *Secondary y-axis selector*, located in the upper part of the *Plot view* window.

The graphic options of the *Plot view* can be configured in the *Local Plot Settings* dialog box, opened with the *Local Plot Settings* command, available in the *View* menu and in the pulldown menu opened by clicking in the plot area with the right mouse button. For details on this dialog box, please consult the HTML version of the help, available in SvanPC++ after pressing the F1 button.

Selection of data

To select data, you can use the cursors or block selections. Each cursor allows to select one element of the data at once, while blocks enable the selection of multiple elements at once.

Main cursor

When you open a window with the plot view, only the *Main cursor* is present. You can set its position by clicking in the plot area, by using the left and right arrow keys or by using the   buttons located in the upper part of the SvanPC++ window. You can also switch the *Main cursor* off, clicking on the  icon next to its name in the table below the plot. When passive, the cursor's icon turns to . In default settings, the current position of the *Main cursor* is marked on the plot with a vertical line in inverted background color.

#1 and #2 cursors

There are two additional cursors available, named *Block cursor #1* and *#2*. You can set their positions by clicking somewhere in the plot area with the right mouse button and choosing the *Put #1* or *Put #2* command in the pulldown menu, or by pressing CTRL+1 or CTRL+2 keys. The selected cursor position is then set at the current position of the *Main cursor*. In default settings, the positions of the additional cursors are marked on the plot with vertical lines in inverted background color with numbers written next to them. You can clear the selections of additional cursors by clicking on the  icons next to their names in the table below the plot.

Block selections

To set a block selection you have to click in the plot area and drag the mouse without releasing until all the elements you need are selected. When you select two different blocks, the selections will be added (previous selections are not removed). The selected area is represented with a gray background. To deselect blocks, click on the  icons next to their names in the table below the plot, or click in the plot area with the right mouse button and choose the *Deselect block(s)* option. You can deselect the current (last selected) block or all blocks at once. You can also invert the block selection. Choosing this option removes the current selection and selects all the remaining data in the file.

Additional features

- The *#1* and *#2* cursors can be used for precise selection of blocks. When both *block cursors* are located on the plot:
 - Pressing ENTER will create a new block selection between the two *block cursors*;
 - Pressing ESC will deselect the part of a block selection from between the cursors (if the area between the cursors contains a fragment of a block).

- When you click on a block with the main cursor, the slider in the table below the plot will be moved automatically to the field containing the range of the selected block.
Note: This feature can be disabled in the *Local plot settings* dialog box.
- Pressing ESC if the #1 and #2 cursors are not placed will remove a block selection containing the *Main cursor*. If the *Main cursor* is not located within any blocks, pressing ESC will remove all the selections (you will be asked for confirmation).

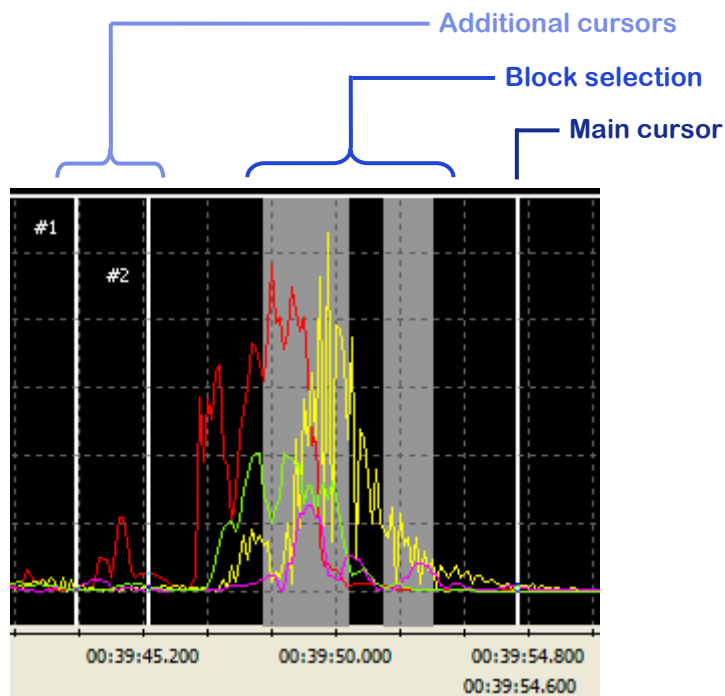


Fig.4.8. Types of data selection in the *Plot view*.

The selected data is listed in the table in the lower left corner of the *Plot view* window (it is not visible if you select the *Only Data* mode). In case of the cursors, the point of their position is given. In case of block selections, the points of begin and end of all separate blocks are given. The *Main cursor* position is also marked below the X-axis of the plot.

4.2.3 SPECTROGRAM VIEW

The *Spectrogram view* is used for 3D visualisation of measurement results of functions in the frequency domain, measured in multiple time points.

The x-axis represents the time domain, the y-axis represents the frequency domain and the z-axis (colors) describes the results values and depends on the currently displayed function. The frequency is shown in a logarithmic scale.

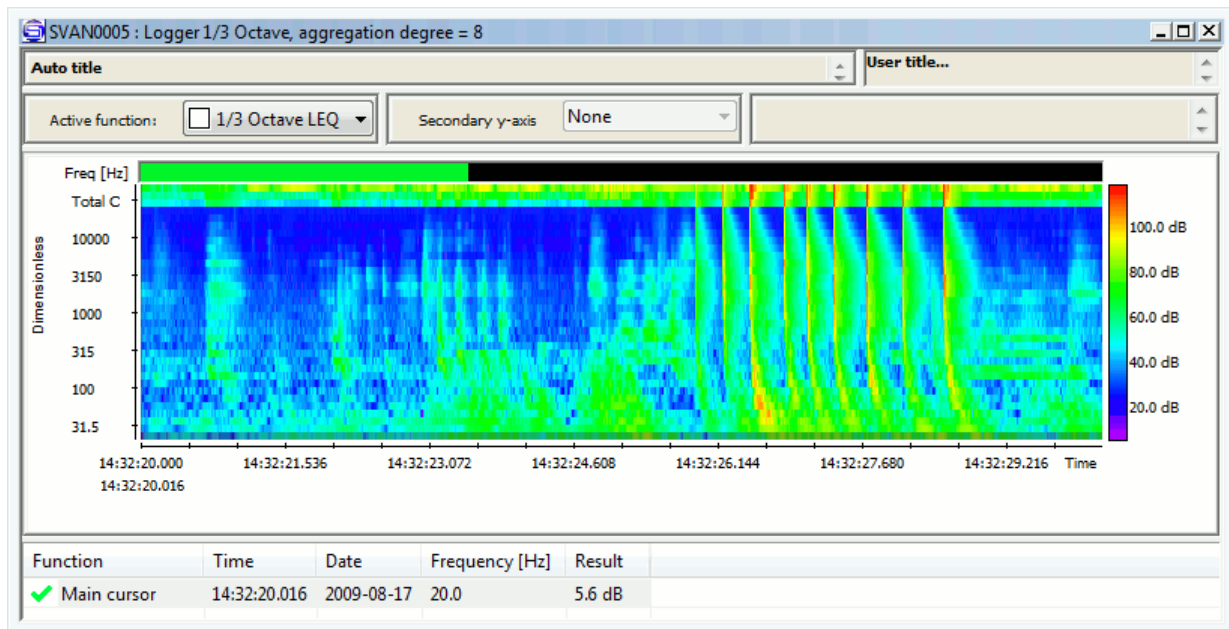


Fig.4.9. An example of the *Spectrogram view*.

To scroll the time axis you can use the green slider above the spectrogram area, or click on the axis below the spectrogram area with the left mouse button and move the mouse without releasing. In contrary to the *Plot view*, axis scaling is not available in the *Spectrogram view*.

The configuration of the *Spectrogram view* window is analogous to the *Plot view* window; for details, see Chapter 4.2.2.: *Plot view*.

Adjusting the view

You can choose the parameter visualised on the spectrogram by using the *Active function* selector in the upper part of the *Spectrogram view* window. This selector is visible only in the *Normal* mode, it is hidden in *Data and Results* and *Only Data* modes. The selected function defines the values on the z-axis.

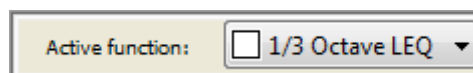


Fig.4.10. The *Active function* selector.

The *Auto-scale z* tool serves to scale the z-axis to fit the range of currently displayed data. When browsing the time domain, the scale will be modified automatically. When you disable the *Auto-scale z* option, the scale will remain unchanged.



Fig.4.11. The *Auto-scale z* control in the *View Toolbar*.

You can modify the profile of the z-axis to set the optimal contrast for the range of data that you need. To do so, click on the color bar representing the z-axis, on the right side of the *Spectrogram* view window. Then click on one of the displayed squares to move the range in which the chosen color will be displayed. You can set 4 points of the profile to adjust the color dynamics as needed. Modifying the color profile does not change the scale of the z-axis.



Fig.4.12. Examples of z-axis color profiles in the *Spectrogram* view.

Data selection

A point of the spectrogram can be selected with the use of the *Main cursor*. To select a point, simply click somewhere in the spectrogram area. You can also modify the position of the cursor using the arrow keys and the  buttons above the *Spectrogram* view window.

The current position of the *Main cursor* is represented as the point of crossing of grey lines, drawn in the spectrogram area. The table below the spectrogram area describe the position of the *Main cursor* in the time and frequency domains, as well as the results value in the selected point.

You can hide / show the *Main cursor* clicking on the  /  icon next to its name in the table below the spectrogram area.

4.2.4 TEXT VIEW

The *Text view* can be used for viewing the *Header information* and measurement results in the text form. Data is presented as simple text with additional descriptions (if available). The text can be copied with the use of the pulldown menu, opened by clicking with the right mouse button, or with the relevant *Edit* menu commands.

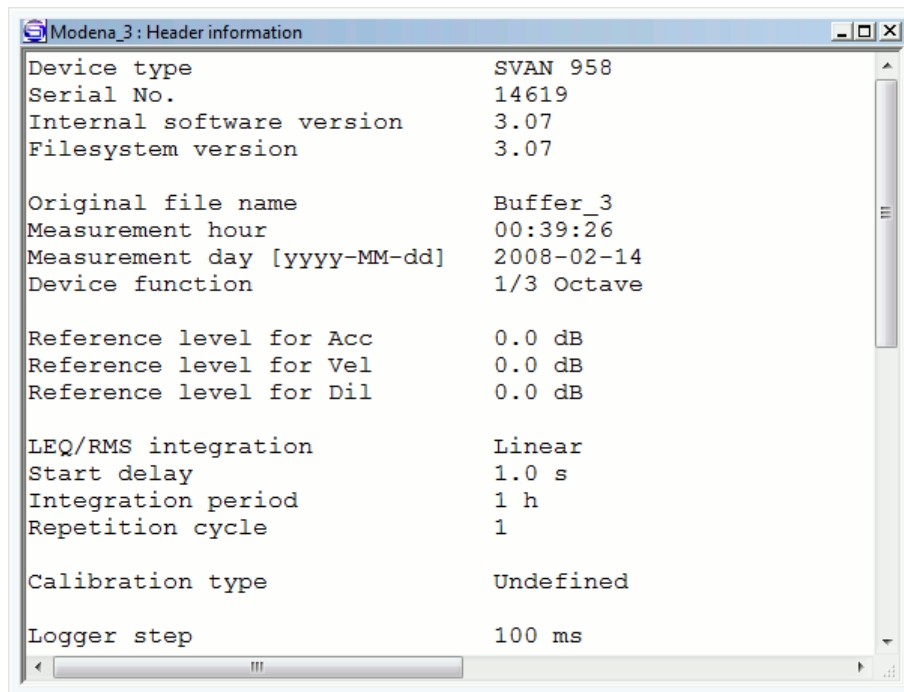


Fig.4.13. An example of the *Text view*.

4.3 DATA-SPECIFIC VIEW SUB-WINDOWS

4.3.1 OPENING VIEW SUB-WINDOWS

After opening a file, downloaded from a Svan instrument or stored on the PC, a *View sub-window* is opened automatically. It is displayed in the working area of the SvanPC++ window, as shown in Fig.4.14a.

- To move a sub-window, click on its title bar with the left mouse button and move the mouse without releasing within the working area.
- To minimize a sub-window, press the  button. A minimized sub-window is automatically located in the lower-left corner of the working area, as shown in Fig.4.14b.
- To maximize a sub-window, press the  button. A maximized sub-window fills the whole working area, hiding all other sub-windows. When a sub-window is maximized, the *Minimize / Restore / Close* buttons are moved to the SvanPC++ menu bar, as shown in Fig.4.14c.
- To close a sub-window, press the  button.

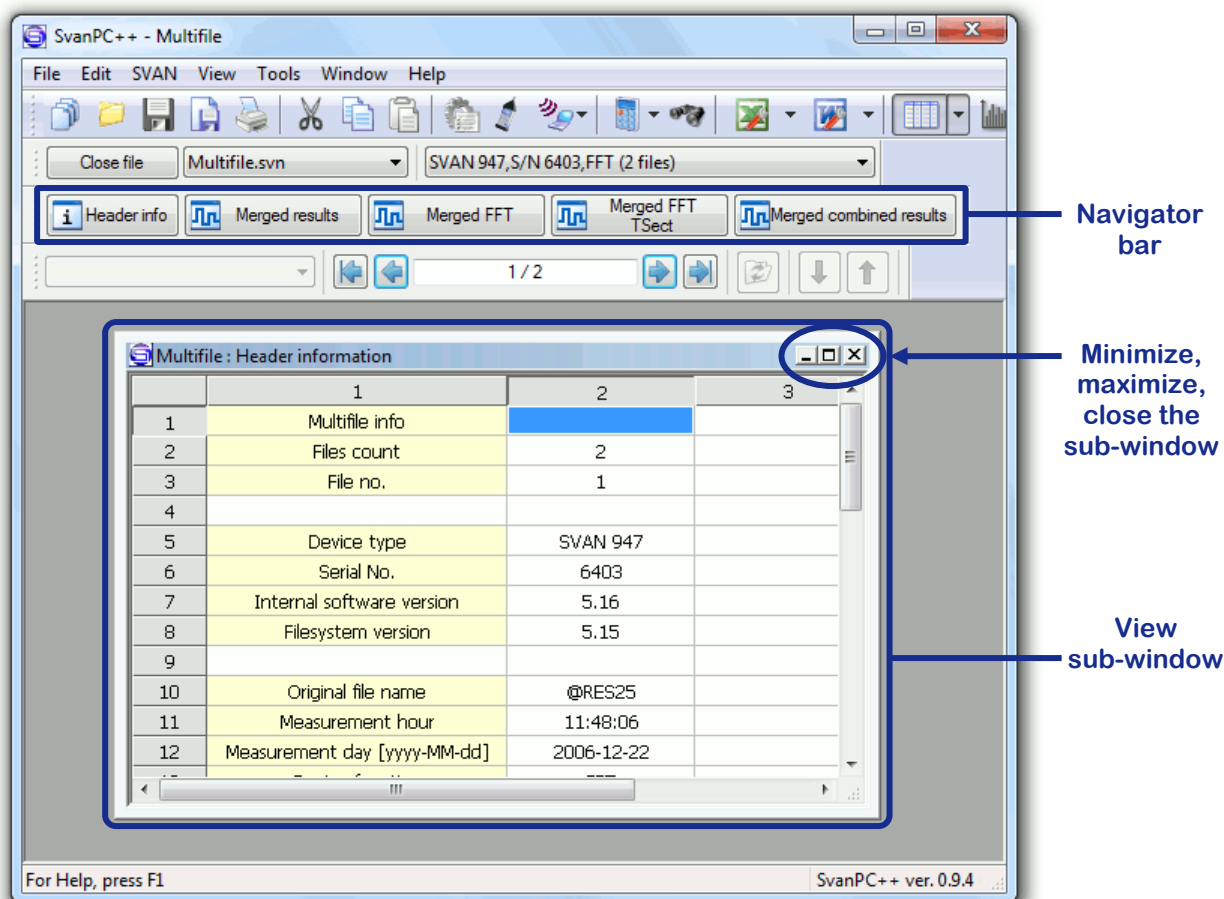


Fig.4.14a. A View sub-window and related controls.

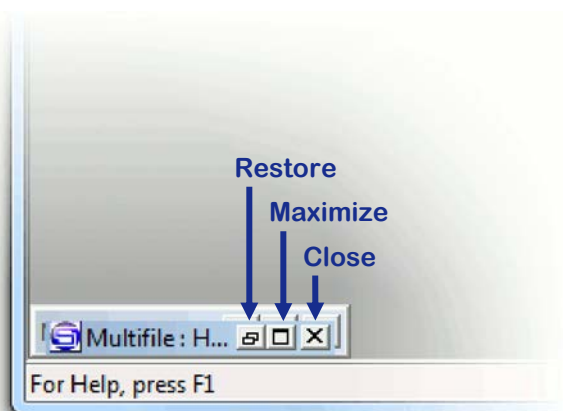


Fig.4.14b. A minimized View sub-window.

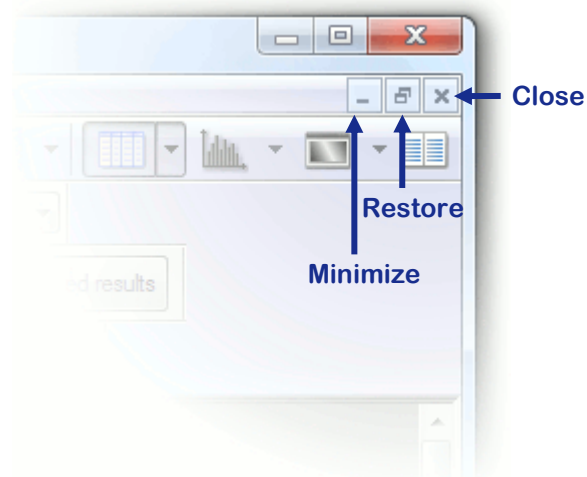


Fig.4.14c. Buttons for minimizing, restoring and closing of a maximized View sub-window.

Depending on the type of the loaded data, there are various views available. You can open multiple views from one file simultaneously, e.g. a *Header Information View*, containing information about the device and measurement, or a *FFT Spectrum View*, containing results of FFT measurements.

To display a desired view, use the buttons located on the *Navigator bar* (see Fig.4.14a). The icons on the buttons correspond to the particular types of data, represented by the views.

You can also choose the type of *View sub-window* displayed automatically when a file is opened. By default, *Header information* is always displayed first. To configure the priority of opening the *View sub-windows*, open the *Main options* dialog box by using the  button or the *Main options* command in the *Tools* menu and go to the *Views* tab.

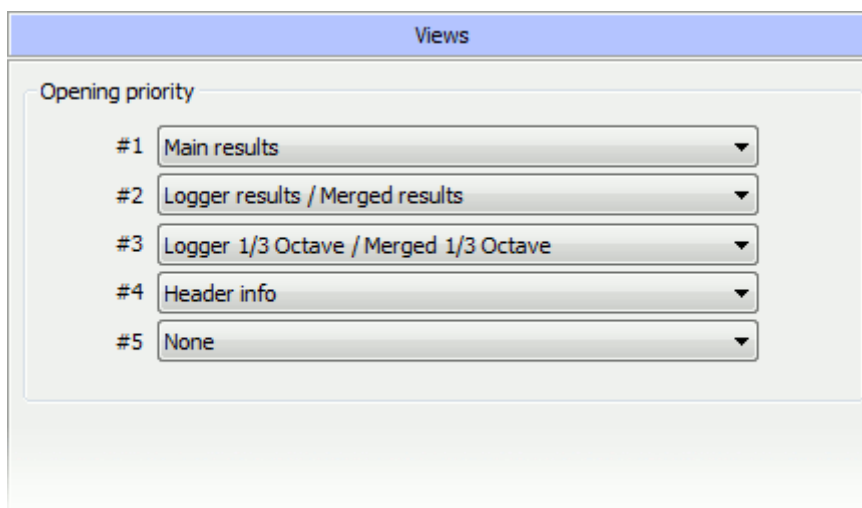


Fig.4.15. The *View sub-windows Opening priority* settings in the *Main Options* dialog box.

The type of data which is defined as *#1* will be opened with the highest priority. If it is not available in the current file, the type of data defined as *#2* will be opened if available, and so on. If none of the data specified in the *Opening priority* list is available, no *View sub-window* will be opened automatically. You can then open a desired view using the *Navigator bar*.

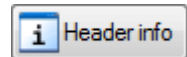
4.3.2 VIEW SUB-WINDOWS TYPES

Depending on the type of data displayed, various *View sub-windows* are characterised by different features.

For particular types of sub-windows different view modes (see Chapter 4.2.: *Data view modes*) are available, e.g. *Header info* can be viewed as a table or in text form, but cannot be viewed on a plot or spectrogram. If a particular view mode is available, the corresponding icon on the Main toolbar is drawn in colors.

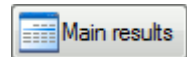
The *View sub-windows* types can be grouped into several categories, each with specific tools and features, as described below.

Header information



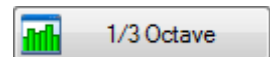
This type of view contains basic information about the opened file, such as the device used for measurement, the instrument settings, name of the file etc. It can be viewed in *Table view* or *Text view*. This data is available in each *.svn* file and by default, this is the *View sub-window* displayed automatically when a file is opened.

Main results



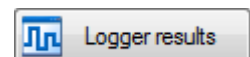
This type of view contains the results of a single measurement, together with some additional information such as the instrument settings or time elapsed during measurement. It is advised to view the *Main results* as a transposed table. The transposition can be easily done by clicking on the  button when the *Table view* is already active. For details, see Chapter 4.2.1.: *Table View*.

Spectral results



This type of view contains the results of measurements in the frequency domain, concerning the *1/1 Octave*, *1/3 Octave* and *FFT* measurements. They can be viewed in a *Plot view* or in a *Table view*.

Logger / merged results



Files containing results of measurements in multiple points of time can be obtained in two ways:

- downloading results of a *Logger*-type measurement from instrument,
- merging several files containing single results.

This first type of data is displayed as *Logger results*, the other as *Merged results*. Both these types of data present the time history of measurement and can be viewed in analogous ways, in a *Plot view* or in a *Table view*.

When a *Result*-type file is currently opened, it is possible to open the *Logger* file associated with it by pressing the  button, located on the *View Toolbar*. If the button is marked grey , it means that there is no connected logger file, as stated in the *Associated file name* field of the *Header*.

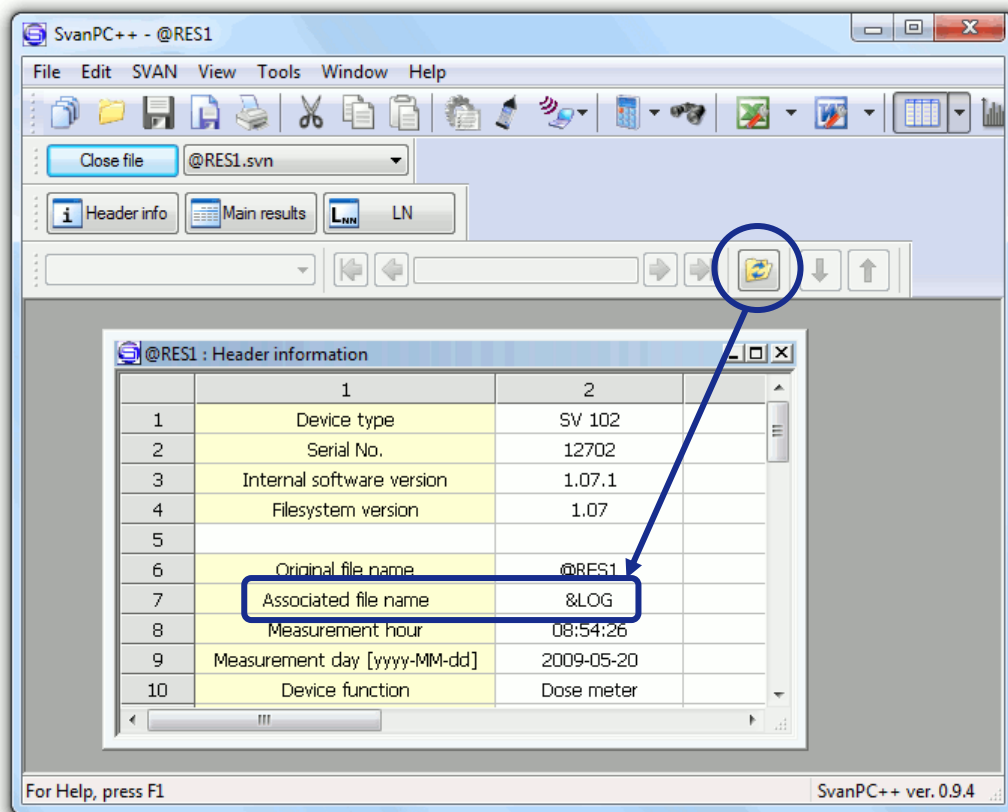
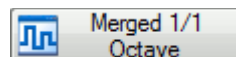


Fig.4.16. Opening the *Logger* file associated to a *Result* file.

Result files, connected to the currently opened *Logger* file, can be opened in an analogous way, using the  button. It is possible only if the *Logger* file has been stored by the instrument with the *Autosave marker* option enabled, and if a *Result* file corresponding to the *Main cursor* position has been created.

Logger / Merged spectral results



Logger and *Merged* results can also be obtained in case of spectral measurements. The name of such a view contains then the type of data (*Logger* or *Merged*) and the type of measurement (*1/1 Octave*, *1/3 Octave* or *FFT*), e.g. *Logger FFT* view.

These types of data can be viewed in a *Table view*, *Plot view*, as well as a *Spectrogram view*. Further description of the *Spectrogram view* can be found in Chapter 4.2.3.: *Spectrogram View*.

While working in a *Plot view*, the spectrum is displayed in a selected point of time. The history of the spectrum can be browsed using the buttons located on the *View Toolbar*, below the *Navigator bar*, as shown in Fig.4.17.

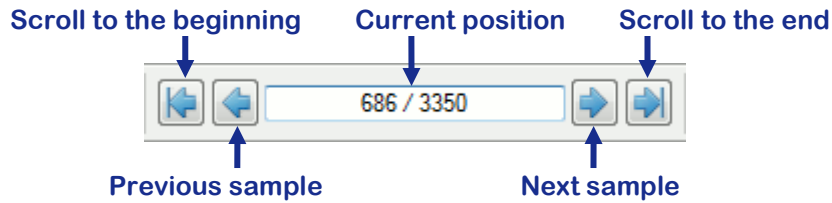


Fig.4.17. *View Toolbar* buttons serving to browse the history of measured spectra.

Statistical views



The *Statistics* view may be available both for *Main results* files and *Logger* files after necessary calculations.

The statistical data can be presented in two different modes: *Histogram* or *LN*. By default, *Histogram* is initially presented. To switch the presentation mode, the selector located on the *View Toolbar* can be used (Fig. 4.18).

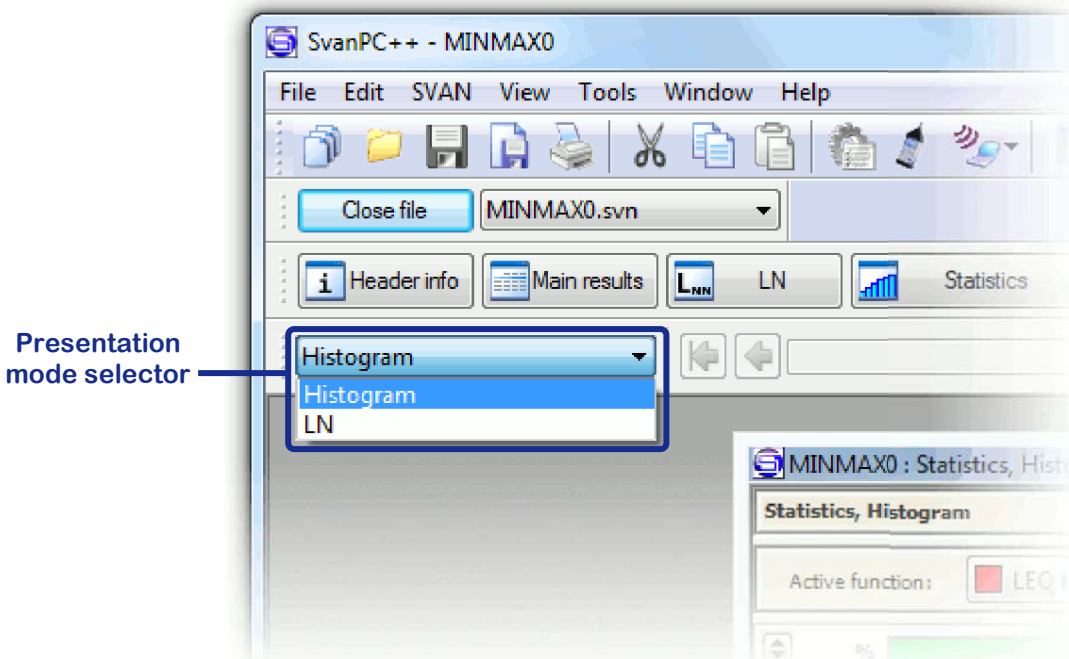


Fig.4.18. Selection of data presentation mode in the *Statistics* view.

The *Statistics* view may also concern spectral results, such as the *1/3 Octave statistic* view and *1/1 Octave statistic* view.

While viewing this type of data in the *Histogram* / *LN* presentation mode, the statistics are displayed for a selected frequency. To select the displayed frequency value, use the  /  buttons, located on the *View Toolbar*.

In case of the spectral statistics, another presentation mode, called *LN(f)*, is available. In this mode, the spectrum is displayed for a selected statistical level. The  /  buttons serve then for the selection of the statistical level.

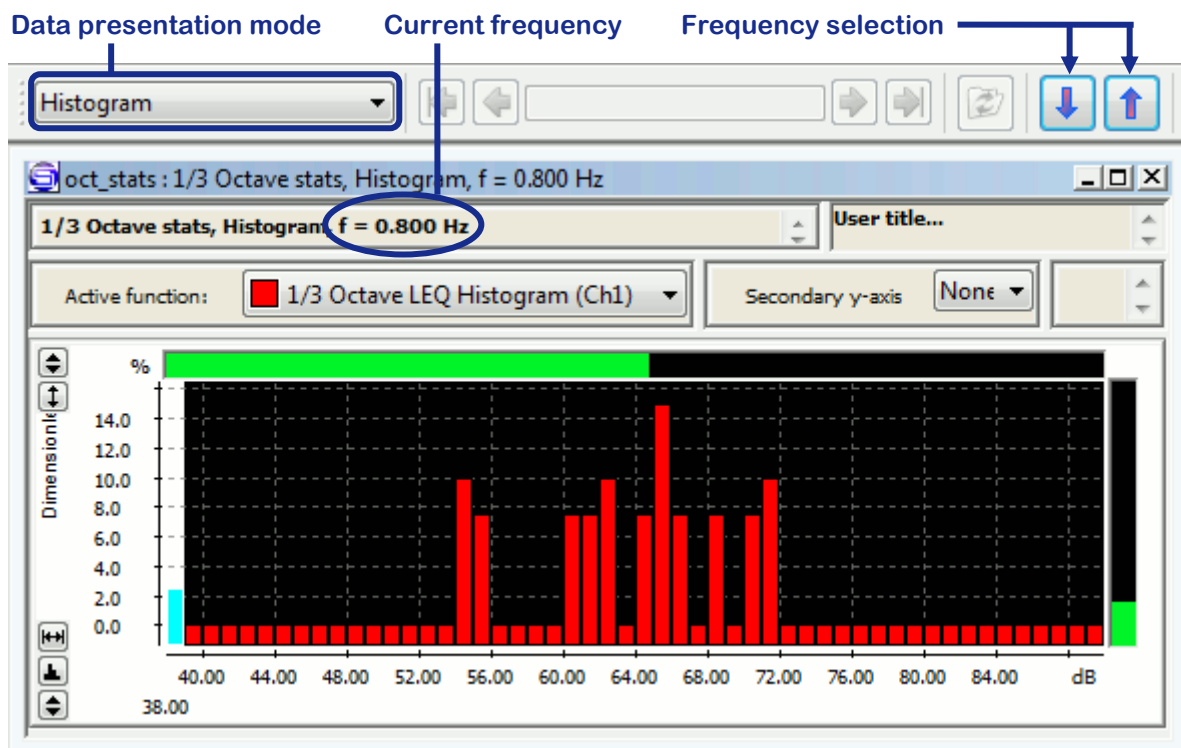


Fig.4.19a. Viewing the *Statistics* for spectral data in *Histogram* or *LN* mode.

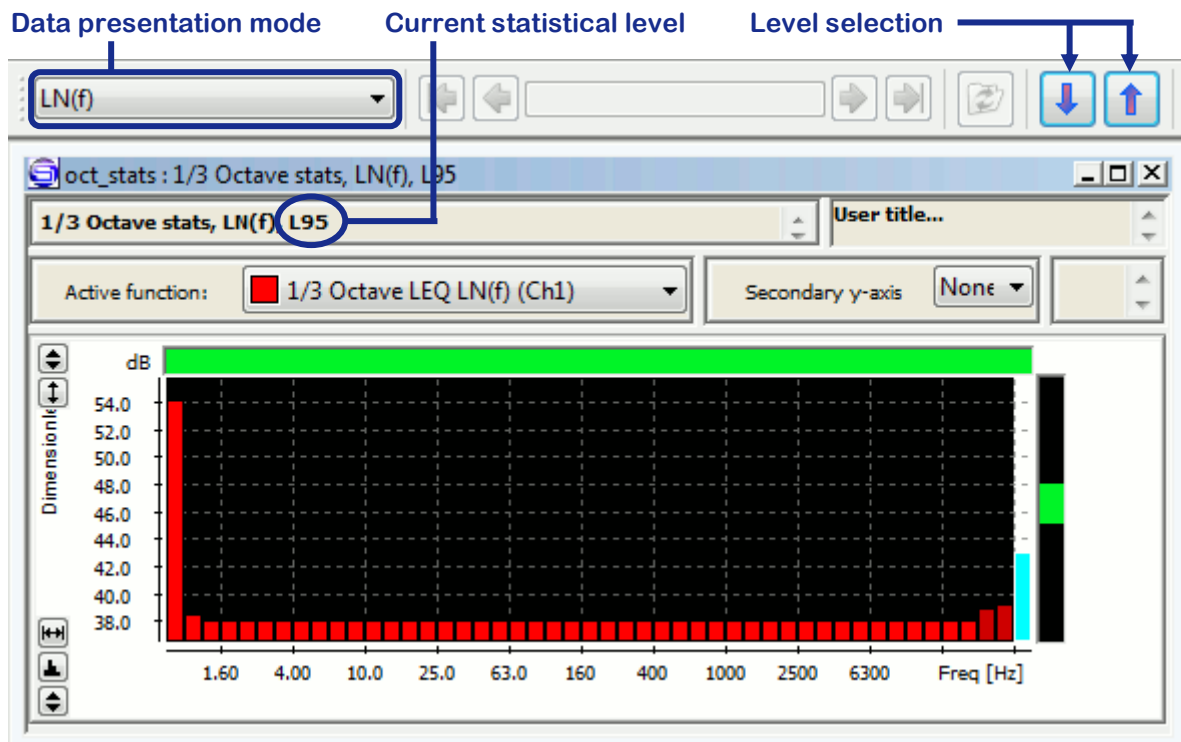
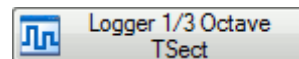


Fig.4.19b. Viewing the *Statistics* for spectral data in *LN(f)* mode.

Time intersection



The *Time Intersection* view is available in case of spectral data, containing measurement results in multiple points of time, such as *Logger / Merged 1/1 Octave*, *1/3 Octave* or *FFT* results. It can be recognized by "T S ect" added to the name of the view.

This type of view allows to display data corresponding to one particular value of frequency, as a function of time. The displayed frequency can be selected using the  /  buttons, located on the *View Toolbar*.

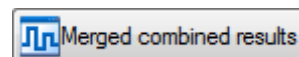
In case of the *Time Intersection* views, the *Data Smoothing* tool is available. You can enable / disable it using the *Smoothing is ON / OFF* button, located next to the frequency selection buttons. Configuration of the data smoothing settings is available in the *RT60* tab of the *Main Options* dialog box. It is possible to configure:

- the size of the sample set used for smoothing,
- the response time value used for background detection in RT60 calculations.

This view is particularly useful for the *Building Acoustics* module users.

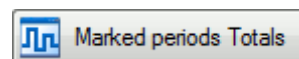
Note: Selecting a point of the time domain in the *Time intersection* view will automatically change the time point displayed in the corresponding spectral *Logger / Merged* view.

Logger / Merged combined results



Some types of results cannot be presented on a plot. The *Combined results* view enables to display all available results gathered together in the *Table* mode. It is useful if various types of measurements have been performed in the *Logger* mode or if various types of results have been merged in a *Multifile*, e.g. *PEAK*, *MIN*, *MAX*, *P-P* results together with *METEO* results.

Marked periods Totals



This type of view is available only for functions recalculated with the *Total values* parameter set in the *Calculator* tool (in contrary to *Running values*).

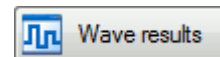
When a function with *Total values* is viewed in a *Table* view of type other than *Marked periods Totals*, its values are repeated in multiple rows that belong to the same calculation period. The repeated values are marked with grey background.

However, in the *Marked periods Totals* view you can view all these functions with their values displayed only once for each period, together with information about the period's start time, duration and name.

In addition, the *Marked periods Totals* view allows to sort the displayed periods by start time or by name. To do so, click with the right mouse button and in the pulldown menu choose the *Sort by start time* or *Sort by name* command.

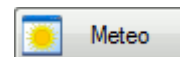
This view can be displayed only in the *Table* mode.

Wave results



This type of view enables to display audio data in .wav format. It can be viewed in *Table* or *Plot* mode. When such a view is opened, the *Wave Navigator* window is automatically activated. For details, see Chapter 4.6.: *Audio Playback*.

Other views



There are several types of *View sub-windows* representing results of special types of measurement, such as:

- *LN*,
- *Tonality*,
- *Loudness*,
- *Meteorological* or
- *RT60*

measurements. These views do not have any special features and can be displayed in *Table* or *Text* mode.

4.3.3 ARRANGING THE WORKING AREA

When multiple views of several documents are opened simultaneously in the SvanPC++ application, the particular sub-windows can be arranged in the working area in various ways. You can use the *Window* menu commands listed in Table 4.1. to obtain the optimal arrangement.

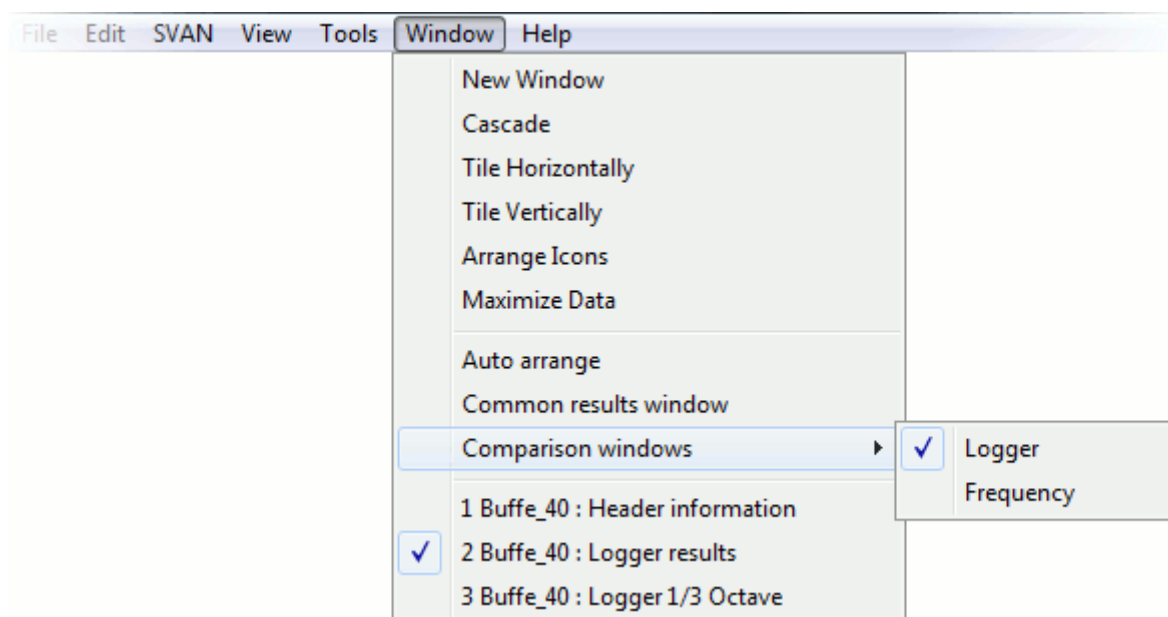


Fig.4.20. *Window* menu commands.

Table 4.1. *Window* menu commands serving for arrangement of sub-windows.

<i>Command</i>	<i>Function</i>
<i>New Window</i>	– Creates a new window with the same data as the currently active window.
<i>Cascade</i>	– Arranges windows in an overlapped fashion.
<i>Tile Horizontally</i>	– Causes the currently opened windows to fill the whole working area, tiled horizontally without overlapping.
<i>Tile Vertically</i>	– Causes the currently opened windows to fill the whole working area, tiled vertically without overlapping.
<i>Arrange Icons</i>	– Arranges only the minimized sub-windows in the lower-left corner of the working area.
<i>Auto arrange</i>	– Arranges windows automatically to use all free space of the screen. When the <i>Auto arrange</i> tool is enabled,  /  icons appear in the top-right corner of each sub-window. They can be used to lock the visibility of particular sub-windows. When the icon is in  position, it will remain visible when a new sub-window is opened.
<i>Common results window</i>	– Displays the results / functions table, usually presented below the plot in the <i>Plot view</i> window, as a separate window.
<i>Comparison windows</i>	– Opens the <i>Logger</i> or <i>Frequency results comparison window</i> , which enables to compare the values of two or more functions in a table. To use this tool (Fig.4.21): 1. Select the functions you wish to compare in the functions list. 2. Press the right mouse button and in the pulldown menu select the <i>Add selected functions to comparison window</i> command. 3. The function values are available to compare in the table. Separate comparison windows are opened for <i>Logger</i>- and <i>Frequency</i>-type functions.
<i>1, 2, ...</i>	– Allows to select the active sub-window from the list of all currently opened sub-windows.

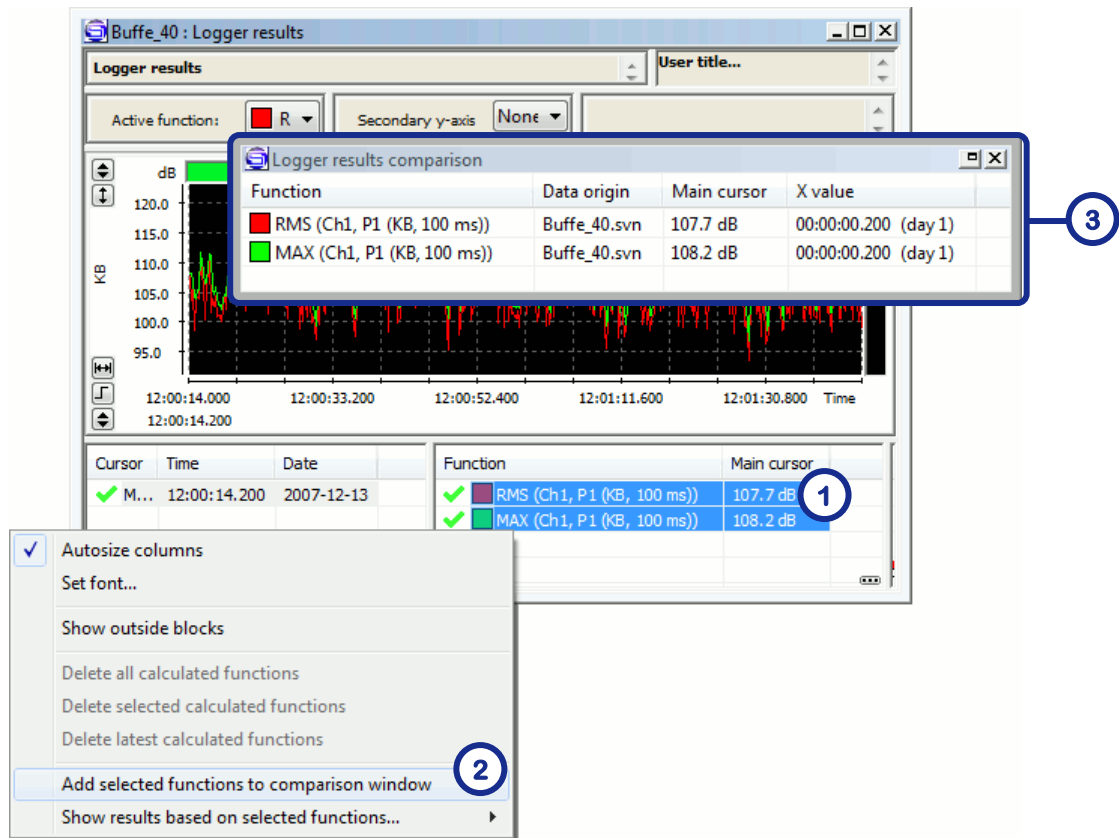


Fig.4.21. Using the *Comparison window*.

4.4 VIEW CONFIGURATOR

The *View Configurator* enables to select the displayed results.

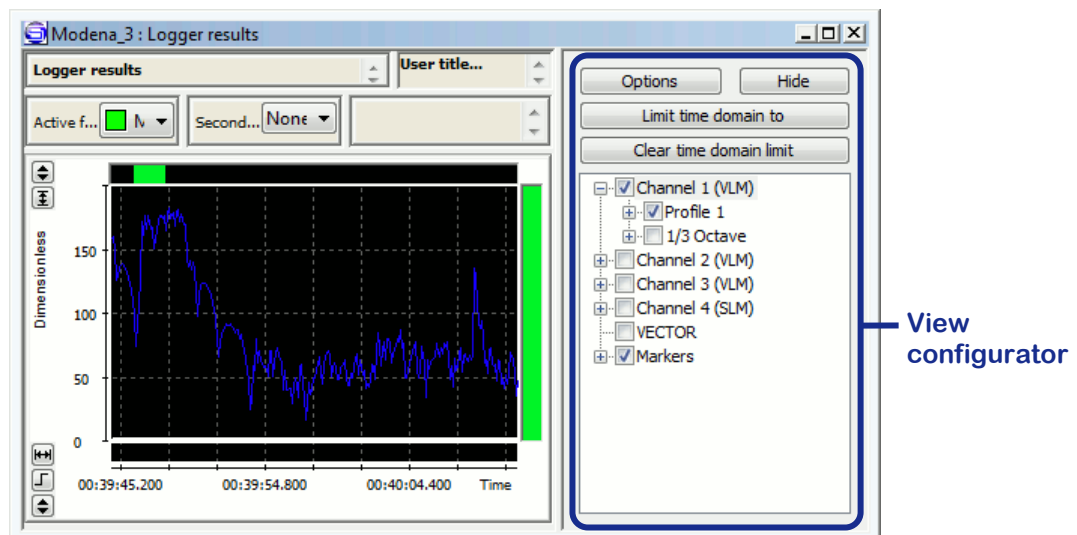


Fig.4.22. The *View Configurator*.

To show / hide the *View Configurator*, use the  button, located on the Main toolbar, or the *View Configurator* command in the *View* menu. It can also be

hidden using the *Hide* button in the upper-right corner of the *View Configurator* sub-window.

By default, the *View Configurator* is presented in the tree structure (*Channel » Profile » Function*). By activating the *Options » Flat view* command, you can view the configurator as a plain list, not representing the structure of data. This also enables to select all the available data at once by selecting the *Flat results* checkbox.

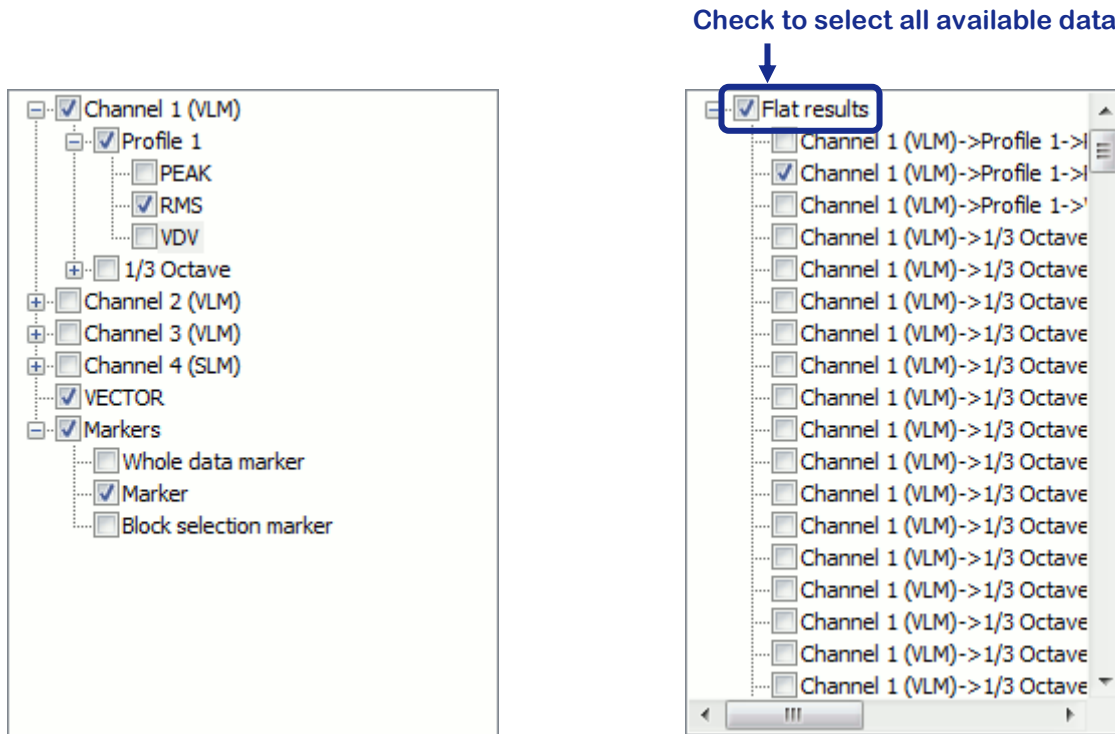


Fig.4.23a. The *View Configurator*'s list in *Tree view* mode.

Fig.4.23b. The *View Configurator*'s list in *Flat view* mode.

The results and functions displayed in *Plot*, *Table* or *Text* are selected in the *View Configurator*. Checking the control next to the name of a result / function adds it to the view. If you check a branch containing more than one result / function, all the data inside the selected branch will be displayed. If you select in this way more than 30 objects at once, you will be asked for confirmation.

The *Limit time domain* tool enables to show only a selected range of data in the *Table* view. Selecting a *Marker* on the list and pressing the *Limit time domain* button will hide in the table all samples not contained within the selected *Marker*'s range. Pressing the *Clear time domain limit* button resets the time domain, showing all the data once again. The time domain limit can be set in any kind of view, but it affects only the *Table* view.

4.5 PLAYBACK

The audio playback in SvanPC++ comprises two main aspects:

- *Logger events* playback,
- *WAVE* files support.

The SvanPC++ tools which allow for playback are the *Events Navigator* and the *Wave Navigator*.

It is possible to choose the device for audio stream playback as well as the buffer length. To do so, open the *Main Options* dialog box using the *Tools » Main Options* command or the  button on the Main toolbar and go to the *Audio Playback* section.

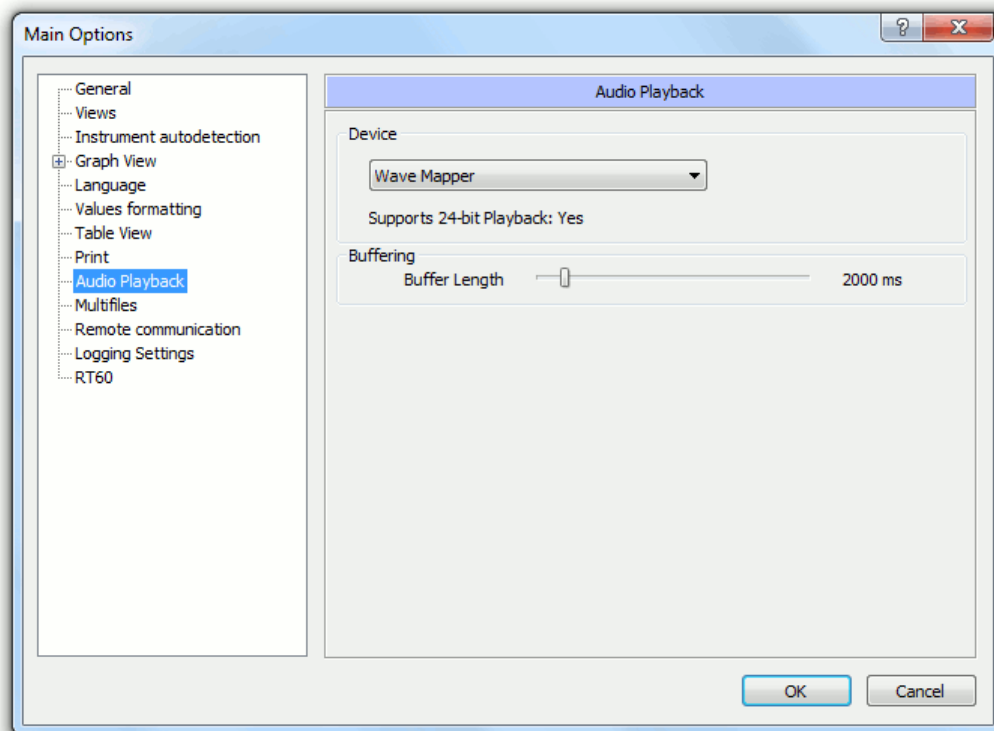


Fig.4.24. Audio playback settings in the *Main Options* dialog box.

4.5.1 EVENTS NAVIGATOR

The *Events Navigator* enables to playback *Logger events*, meaning audio records assigned to particular fragments of *logger*-type data.

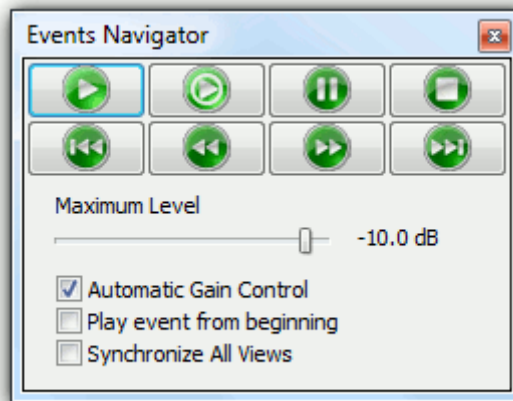


Fig.4.25. The *Events Navigator* window.

This window appears automatically when a file containing *Logger events* data is opened. You can also show / hide it manually, using the *View » Events/Wave Navigator* command.

Functions of the *Events Navigator's* buttons are described in Table 4.2.

Table 4.2. The *Events Navigator's* buttons.

Button	Function
	– Plays current audio event, beginning from the current position of the <i>Main cursor</i> .
	– Plays all available audio events from the beginning.
	– Pauses the playback.
	– Stops the playback and rewinds to the beginning of current audio event.
	– Rewinds to the beginning of the first available audio event.
	– Rewinds to the beginning of the previous audio event.
	– Forward to the beginning of the next audio event.
	– Forward to the beginning of the last available audio event.

The *Maximum Level* slide bar enables to set the audio signal boost level. 0 dB leaves the signal at its original level.

The *Automatic Gain Control* tool serves to automatically adjust the signal boost. With this option on, fragments of audio data will be perpetually analysed in order to maximize the signal dynamics, given the *Maximum Level* slide bar is left at 0 dB. The length of analysed fragments can be specified in *Main Options » Audio Playback » Buffer Length*. The minimal value of the *Maximum Level* parameter depends on signal bit depth, e.g. 144 dB for 24 bit, 96 dB for 16 bit. Differences below 12 dB between the sequential fragments of audio data will not affect the boost level. The algorithm reduces the boost level faster than increases, so that sudden loudness is avoided.

The *Play event from beginning* option alters the behaviour of the *Play* button, automatically moving the *Main cursor* to the beginning of current event before starting playback.

The *Synchronize All Views* option allows for simultaneous movement of the data selection tools in all opened windows which contain the audio record (comprising the *Main cursor* in case of *Plot view* and the selection bar in case of *Table view*).

4.5.2 WAVE NAVIGATOR

The *Wave Navigator* enables to playback audio files in WAVE format.

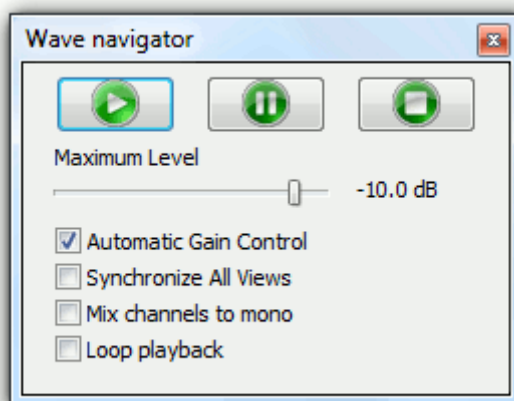


Fig.4.26. The *Wave Navigator* window.

This window appears automatically when a *Wave results* view is opened. You can also show / hide it manually, using the *View » Events/Wave Navigator* command.

Functions of the *Wave Navigator's* buttons are described in Table 4.3.

Table 4.3. The *Wave Navigator*'s buttons.

<i>Button</i>	<i>Function</i>
	– Plays current wave file, beginning from the current position of the <i>Main cursor</i> .
	– Pauses the playback.
	– Stops the playback and rewinds to the beginning of current wave file.

The *Maximum Level*, *Automatic Gain Control* and *Synchronize All Views* options are analogous to those in the *Events Navigator*. For details, see Chapter 4.5.1.: *Events Navigator*.

The *Mix channels to mono* option mixes the signal from all channels to be played the same in all output channels.

The *Loop playback* option causes the wave file to be played from the again when the cursor reaches the end of file.

5 POST-PROCESSING AND DATA ANALYSIS

Except of the tools for data visualisation and playback described in Chapter 4, the base *Viewer* module of the SvanPC++ software suite offers several ways of data post-processing, such as:

- Units conversion,
- Data aggregation by time and frequency,
- Using markers for selection of data,
- Recalculation of various VLM parameters,
- Conversion of the spectral data domain.

In addition, some features of the *Calculator* tool are available in the basic SvanPC++ module, such as:

- *Total LEQ* and *Total RMS* recalculation,
- *Transfer function* and *coherence* recalculation with cross spectrum result files.

More data analysis-related tools are available after purchasing an additional module of SvanPC++, such as e.g. the *Environmental Monitoring* module.

5.1 VIEWER MODULE POST-PROCESSING TOOLS

5.1.1 UNITS CONVERSION

While visualising the data in the *Viewer* module, you can easily recalculate logarithmic to linear and linear to logarithmic units. In case of VLM results, it is also possible to display the values in linear non-metric units.

The available units are shown in Table 5.1.

Table 5.1. Units for displaying SLM and VLM results available in SvanPC+.

	<i>SLM results</i>	<i>VLM results</i>		
		<i>Acceleration</i>	<i>Velocity</i>	<i>Displacement</i>
<i>Logarithmic</i>	[dB]	[dB]	[dB]	[dB]
<i>Linear</i>	[Pa]	[m/s²]	[m/s]	[m]
<i>Linear non-metric</i>	-	[g]	[ips]	[mil]

To select the units for sound level results you can use the pulldown menu available in *View* menu » *SLM Units*. To switch between the units, you can also press the  button on the Main toolbar.

Analogously, to select the units for vibration level values, go to *View* » *VLM Units*. Pressing the  button will also switch between the available units.

5.1.2 ZOOM PLUS / MINUS TOOLS. AGGREGATION

The *Zoom* tools serve to adjust the amount of displayed data.

In case of the *Plot view*, this concerns manipulating the number of pixels per sample. In case of *Table view*, increasing the zoom from the original level cannot affect the way data is displayed.

However, in all view modes, the zoom can be reduced in reference to the original level, meaning that multiple samples are represented by one pixel or cell. This requires the application of *data aggregation* algorithms. Later on in this section, we will consider the *aggregation level* as a measure of samples represented by one element (pixel in a plot / cell in a table).

Table 5.2. Relation between the *aggregation level* and other parameters of data visualisation

<i>Aggregation level</i>	<i>Samples per pixel</i>	<i>Range of visible data</i>	<i>Plot example</i>
Lower	Less	Smaller	Fig.5.1a.
Higher	More	Greater	Fig.5.1b.

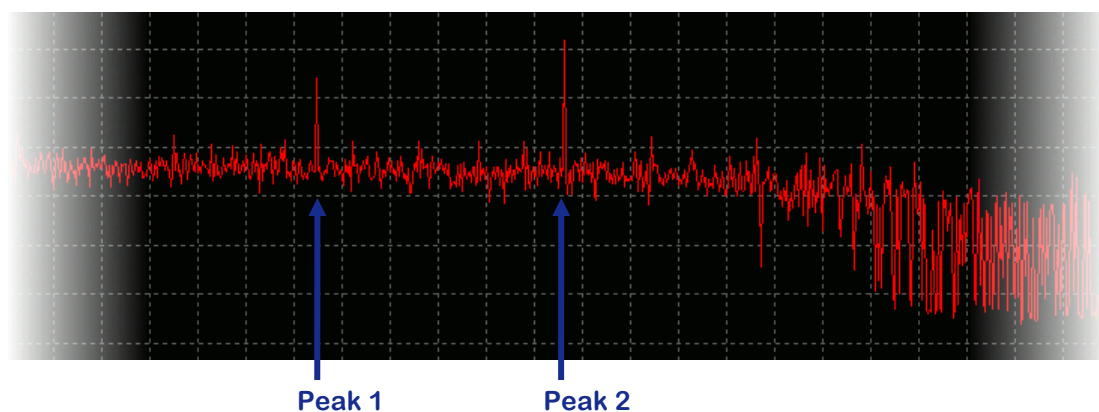


Fig.5.1a. An example of *Plot view* with lower aggregation level.

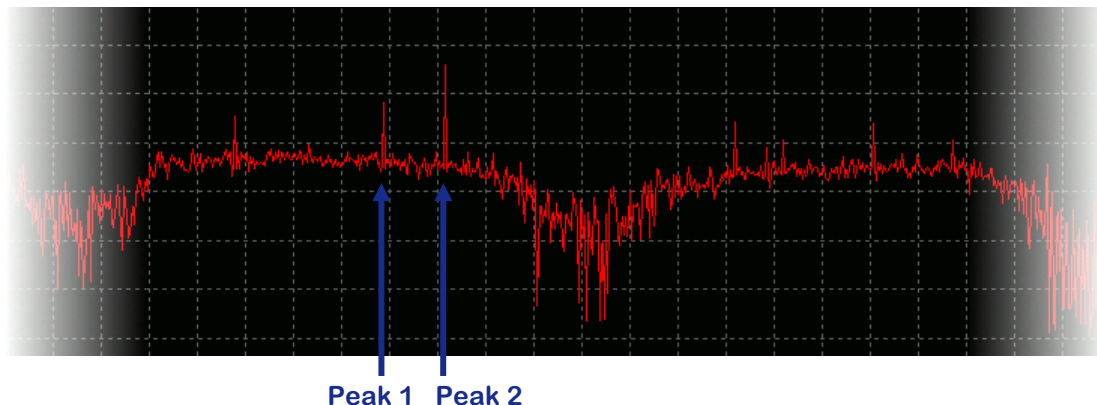


Fig.5.1b. An example of *Plot* view with higher aggregation level.

To reduce / increase the aggregation level, use the *Zoom Plus / Zoom Minus* tools by clicking on the  /  buttons on the Main toolbar. In case a *Plot view* is currently active and aggregation is not applied, using these buttons you can increase / decrease the number of pixels per sample.

The aggregation level is always divided or multiplied by 2, while the number of pixels per sample is always increased or decreased by 1.

You can also set the aggregation level manually using the *Set aggregation level* command from the pulldown menu, opened next to the *Zoom Plus / Minus* buttons. The desired level can be then typed in the *Set aggregation level* dialog box. The maximal aggregation level equals the number of samples in the current data.

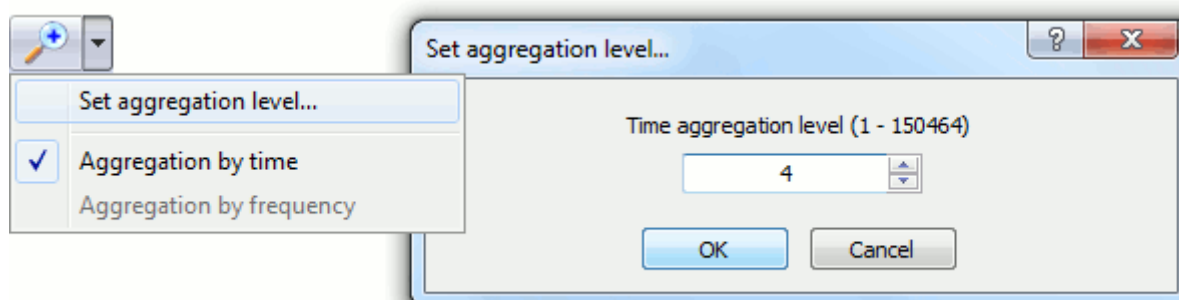


Fig.5.2. Manually setting the aggregation level.

Using the same pulldown menu, you can also decide whether aggregation should be applied to the time or frequency domain, if it is available in the currently viewed data.

5.1.3 MARKERS

Markers can be used as a tool for data classification in the *Viewer* module.

Markers count as binary functions defined in the time domain. A marker denotes a certain range of data, specified automatically or selected by the

user. They can be stored in a file by a Svan instrument, or created in the SvanPC++ software.

Note: This tool is especially useful and applicable in the *Plot view* mode. However, markers can also be used in the other modes, e.g. for time domain limiting in the *Table view*. For details on visualisation modes in SvanPC++, see Chapter 4.2.: *Data View Modes*.

Creating markers

Markers divide into two types:

- *Block* markers,
- *Point* markers.

The block markers contain a finite range of data, while point markers only contain one sample.

To create a *block* marker:

1. Define a data block selection in the plot area, simply dragging the mouse with left button pressed.
Note: A block marker does **not** have to be continuous, i.e. it can be composed of several separate ranges.
2. Press the right mouse button to open a pulldown menu.
3. In the menu, select *Edit markers* » *Use selected blocks* » *New marker*.
4. Specify the desired name and color for the new marker in the *Create New Marker* dialog box.

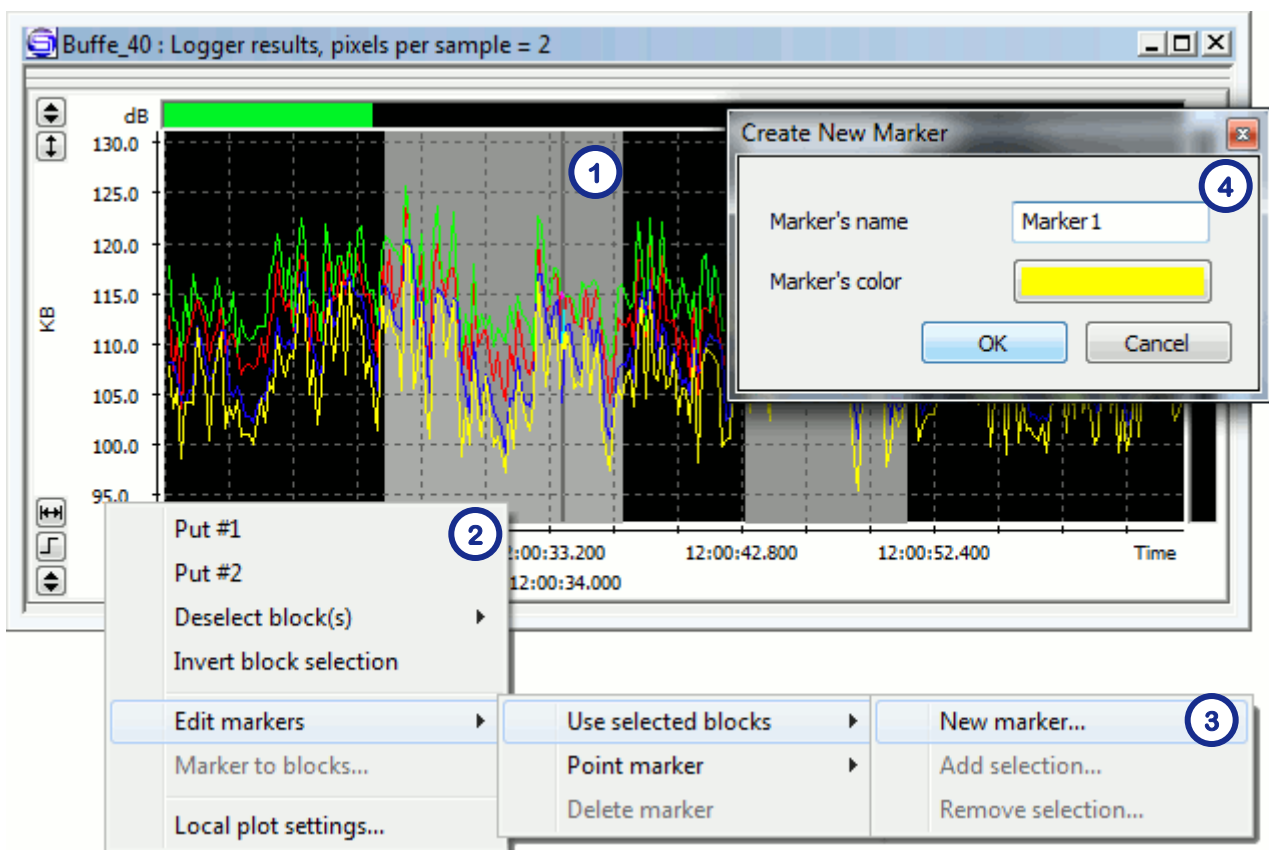


Fig.5.3. Creating a block marker.

While creating *point* markers, instead of making block selections in the plot area you only have to place the *Main cursor* at the desired location (simply clicking with the left mouse button). The rest of the process is analogous to the creation of block markers, the only difference being the path in the pulldown menu: *Edit markers* » *Point marker* » *New marker*.

Markers visualization

Markers are visible in the *Plot view* as horizontal lines below the plot area, above the x-axis. In case of point markers, semi-transparent vertical lines are also drawn. Each marker has its own color, chosen during its creation.

The created markers are listed in the *Calculated functions* table below the plot. To show or hide markers, click on the ✓ / ✗ icons, located next to their names on the list.

In the *Table view*, markers are considered as one of the functions available for displaying. You can select the values displayed in the table for data contained / not contained within range of a marker using the *Table view* tab in the *Main options* dialog box, opened with the  button on the Main toolbar, or with the *Main Options* command in the *Tools* menu.

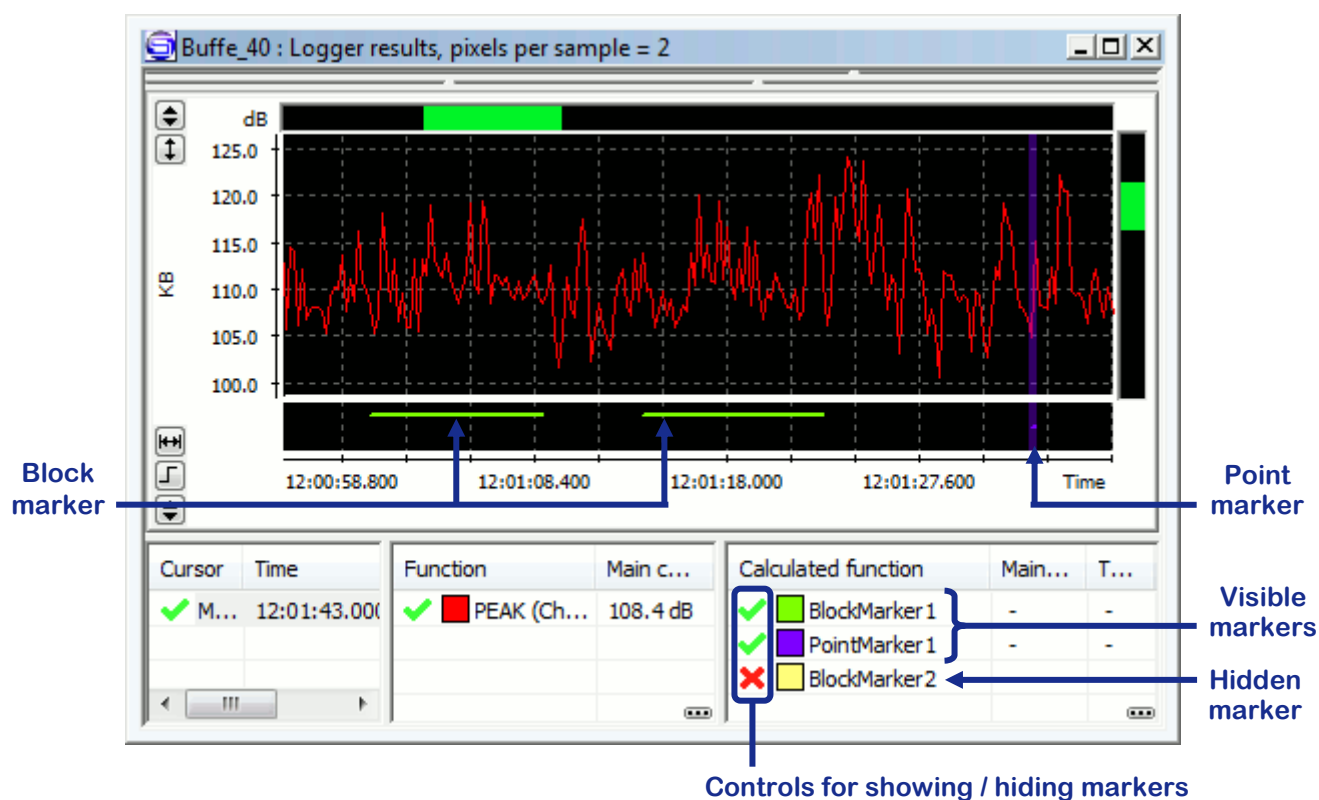


Fig.5.4. Visualization of markers in the *Plot view*.

Editing markers

To modify the ranges of markers, you can use the pulldown menu opened by clicking with the right mouse button. Following commands are available:

- *Edit markers » Use selected blocks » Add selection* – adds the current block selection to a chosen marker.
- *Edit markers » Use selected blocks » Remove selection* – subtracts the current block selection from a chosen marker.

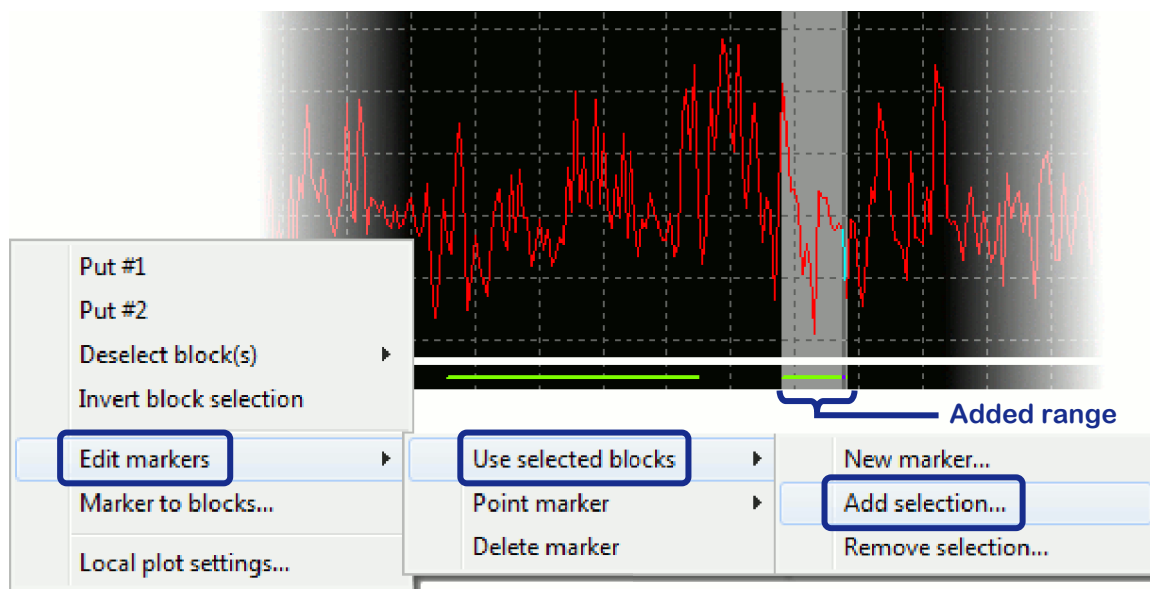


Fig.5.5a. Adding block selection to the range of a marker.

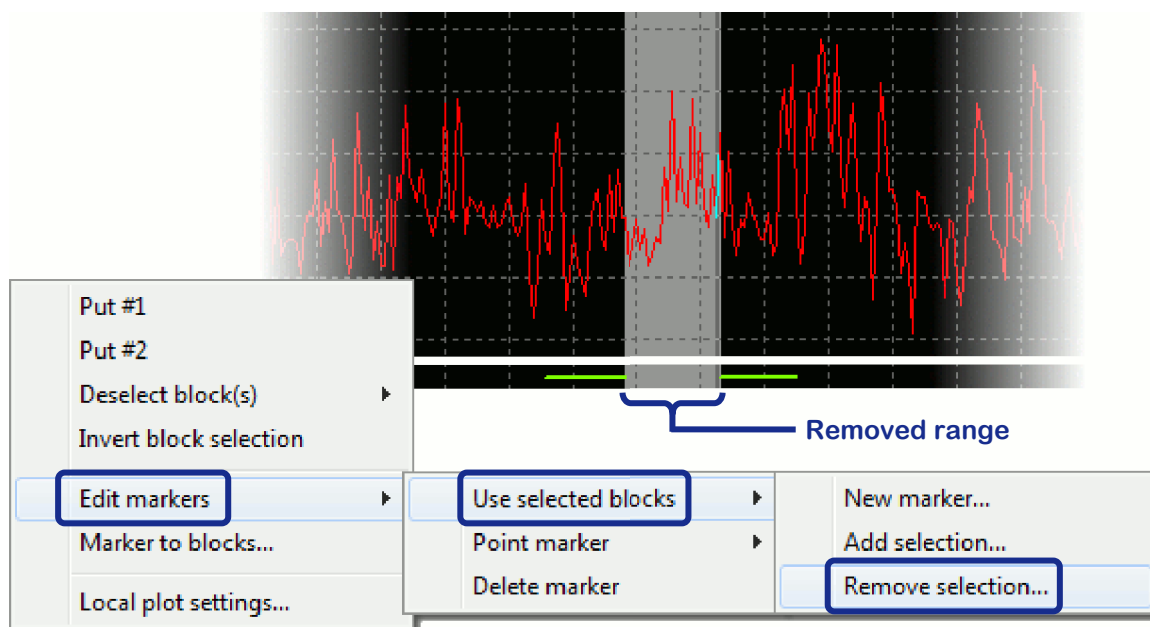


Fig.5.5b. Removing block selection from the range of a marker.

- *Edit markers » Point marker » Add cursor position* – adds the sample at the current position of the *Main cursor* to a chosen marker.
- *Edit markers » Point marker » Remove cursor position* – subtracts the sample at the current position of the *Main cursor* from a chosen marker.
- *Edit markers » Delete marker* – deletes a chosen block or point marker.

Every time you modify or delete a marker, the *Choose marker* window will appear. It serves to select the marker you wish to modify or delete. You can select multiple markers, clicking on their names with CTRL pressed. You can also select several successive markers, clicking on the first one and then the last one with SHIFT pressed.

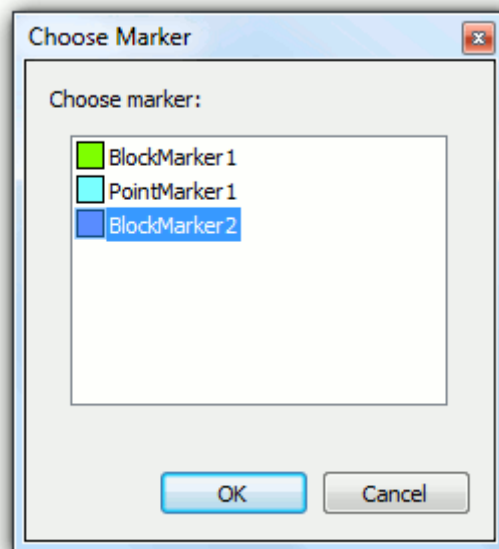


Fig.5.6. The *Choose Marker* dialog box.

Selecting marker ranges

Clicking twice on a marker representation below the plot selects a range of the marker.

Note: If the marker is non-continuous, only the range within the nearest non-continuities is selected.

- You can select multiple ranges at once. To do so, double-click on each of the desired ranges.
- Clicking twice on an already selected marker range deselects it.
- To deselect all markers ranges, double-click somewhere in the plot area outside of all markers representations.

You can modify the markers by dragging the selected ranges:

- Clicking with the left mouse button on a selected marker range and moving the mouse without releasing will move the selected range within the time domain. Pressing the SHIFT button before releasing the mouse will move the ranges back to the original positions.

Note: If multiple ranges are selected, this tool will move all the selected ranges simultaneously, also if the ranges belong to different markers.

- Clicking with the left mouse button on a selected marker range with the CTRL button pressed and moving the mouse without releasing will resize the selected range. Pressing the SHIFT button before releasing the mouse button will resize the range back to the original size.

Note: If multiple ranges are selected, this tool will deselect all the ranges except of the resized one.

If at least one marker range is currently selected, clicking with the right mouse button on a marker representation will activate a pulldown menu, containing the following commands:

- *Selected ranges to blocks* – adds the selected markers ranges to the block selection on the plot.
- *Add selected ranges to another marker* – adds the selected markers ranges to a chosen marker.
- *Remove selected ranges from marker* – subtracts the selected markers ranges from a chosen marker.

Quick markers adding

You can add markers using *right ALT + [0...9]* convention. A new point marker of the name *M[0...9]* will be automatically created in the current location of the Main cursor.

If a cursor of the selected number already exists, the sample selected with the Main cursor will be added to the selected marker.

Special markers

Some markers are created automatically and cannot be edited. This includes:

- The *Audio marker* shows the time ranges containing audio data, if available in the currently viewed data.
- The *Whole data marker* contains the whole time domain.
- The *Pause* or *Break* marker shows the time ranges containing pauses or breaks, if available in the currently viewed data.
- The *Block selection marker* denotes the current block selection.

Note: The *Whole data marker* and the *Block selection marker* is only applicable in *Table view*.

5.1.4 ACCELERATION, VELOCITY AND DISPLACEMENT

In case of VLM spectra measurement results SvanPC++ Viewer offers the recalculation of three parameters:

- *Acceleration*,
- *Velocity*,
- *Displacement*.

This concerns the files where spectral data is given, e.g. *1/3 Octave* results.

To select the parameter you wish to display, use the pulldown menu opened next to the button for *VLM units* selection on the Main toolbar.

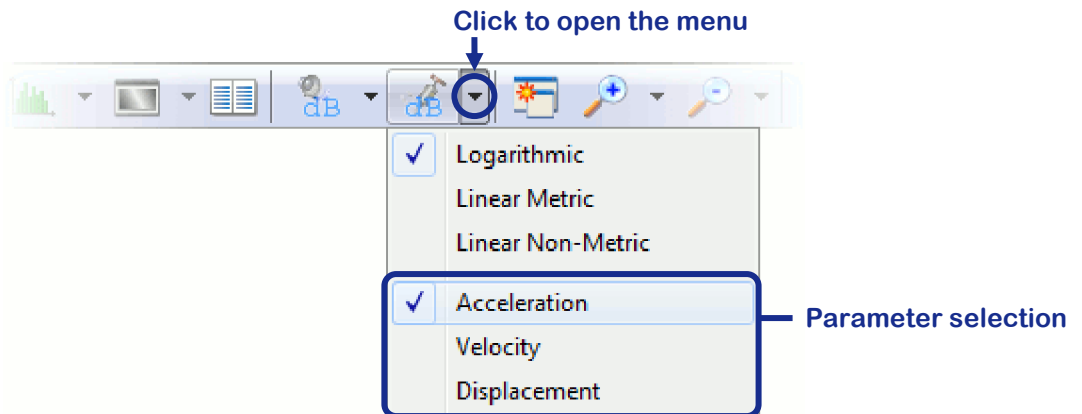


Fig.5.7. Selection of the displayed VLM parameter.

Acceleration, velocity and displacement can all be displayed simultaneously. In the *Plot view* the particular parameters can be recognized in the functions list below the plot by "Acc" for acceleration, "Vel" for velocity and "Dis" for displacement added to the name of the function.

Function	Main cursor	
✓ 1/3 Octave Acc RMS (Ch3)	75.2 dB	
✓ 1/3 Octave Vel RMS (Ch3)	120.7 dB	
✓ 1/3 Octave Dis RMS (Ch3)	166.3 dB	

Fig.5.8. Functions list containing the same function for various VLM parameters.

5.1.5 SPECTRUM RECALCULATION

Conversion from FFT to 1/3 octave spectrum and from 1/3 octave to 1/1 octave spectrum can be easily done in SvanPC++ Viewer.

If a FFT- or 1/3 octave-based function is available in the current data file, you can display the same measurement results in another domain by doing the following (as illustrated on Fig.5.9):

1. Go to *Plot view* by clicking on the  icon.
2. Select the function(s) you wish to convert in the list below the plot.

3. Click with the right mouse button to open the pulldown menu.
4. Choose *Octaves 1/3* or *Octaves 1/1* from the *Show results based on the selected functions* menu.

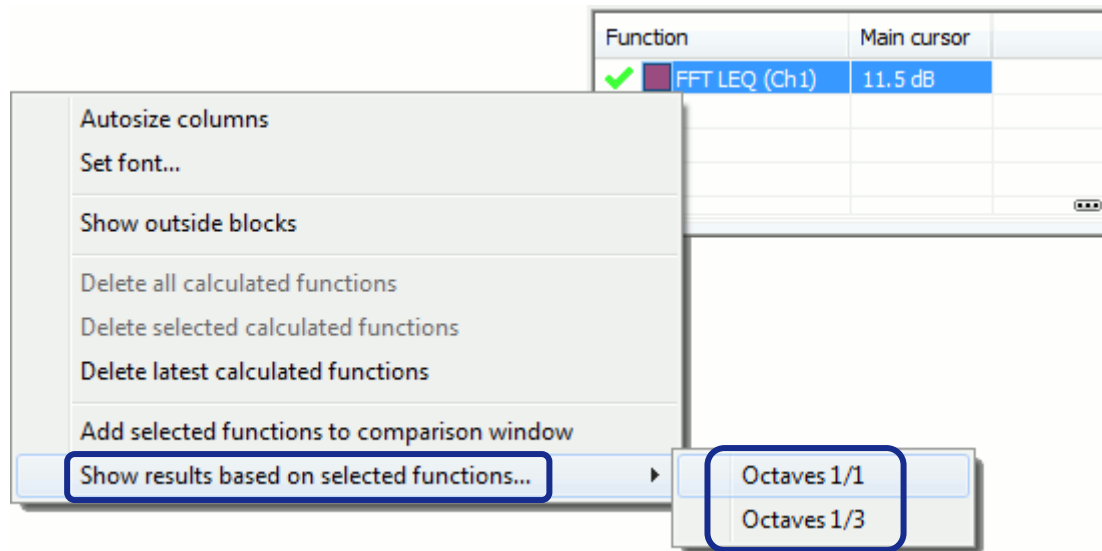


Fig.5.9. Recalculation of 1/1 octave and 1/3 octave spectrum from FFT spectrum.

The new function will be opened in a new view sub-window, e.g. a *1/3 Octave view* or a *1/1 Octave view* sub-window.

5.2 TOTAL RMS / LEQ AND CROSS-SPECTRA RECALCULATIONS

SvanPC++ enables the recalculation of various functions, based on the measurement data downloaded from a Svan instrument or saved in a Svan file. In the base *Viewer* module of SvanPC++ the recalculation of *Total RMS* and *LEQ* is available, as well as *Transfer function* and *Coherence* for cross spectrum results files.

5.2.1 SVAN PC++ CALCULATOR TOOL

You can gain access to the *Calculator* using the *Calculator* pulldown menu, opened by clicking on the  icon on the Main toolbar or through the *Tools* » *Calculator* menu.

The base module of SvanPC++ enables the application of two Calculator sub-modules:

- *Total RMS / LEQ*,
- *Cross-spectra*.

If a type of recalculation is not supported for the currently opened data, the corresponding command will be disabled.

When you click on a command related to a Calculator sub-module, the *Calculator* dialog box will appear.

5.2.2 TOTAL RMS / LEQ

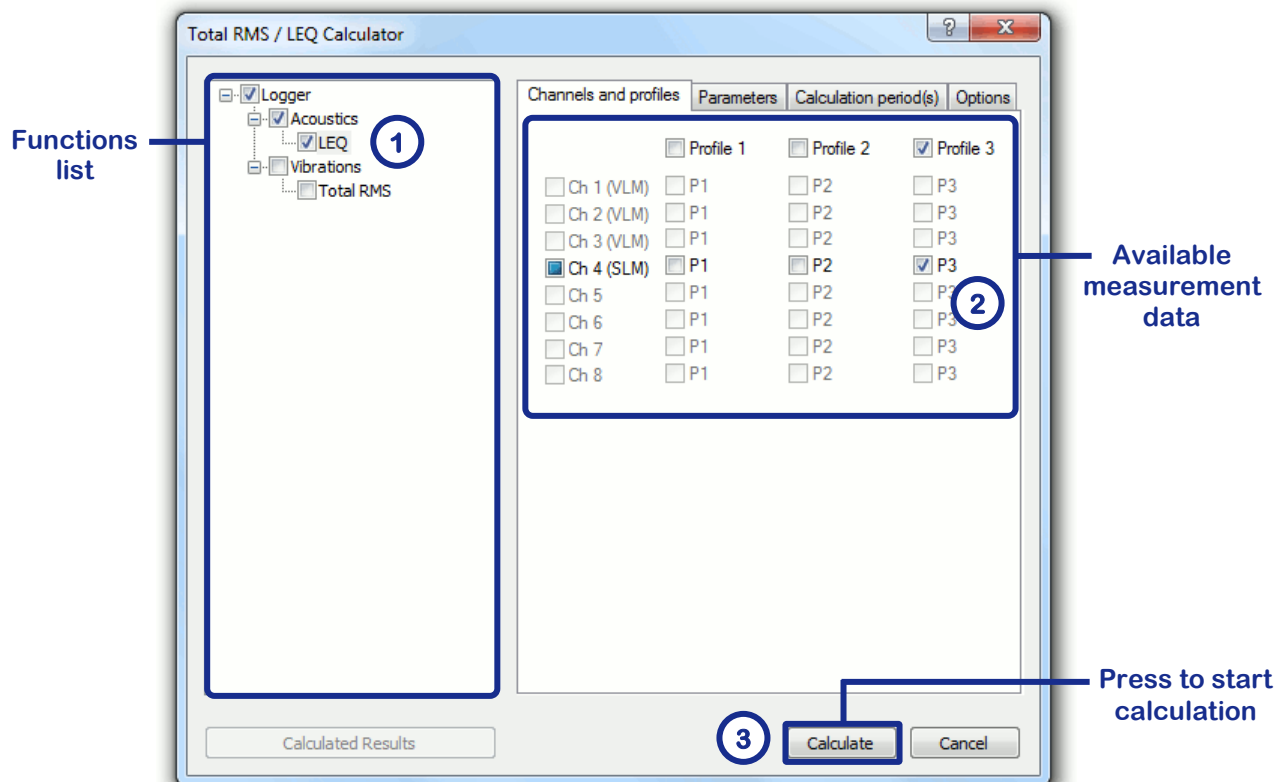


Fig.5.10. Calculator dialog box for *Total RMS / LEQ* recalculations.

The recalculations can be carried out by doing the following:

1. Select the function you wish to recalculate on the list at the left side of the *Calculator* dialog box. To select a function, click on the check-box next to its name.

Note: You can recalculate both functions simultaneously.

2. Select the measurement data on which the recalculation should be performed. All the available measurement channels and profiles are displayed in the *Channels and profiles* panel at the right side of the dialog box. The enabled check-boxes correspond to the data for which the selected function is supported.
3. Press the *Calculate* button.

Note: The *Parameters*, *Calculation period(s)* and *Options* are not available to configure in the free (*Viewer*) module of SvanPC++.

The recalculation is performed for the current block selection made in the *Plot view* of the analysed data. To perform calculation on the whole available data, remove the block selection. For details on data selection, see Chapter 4.2.2.: *Plot view*.

5.2.3 CROSS-SPECTRA

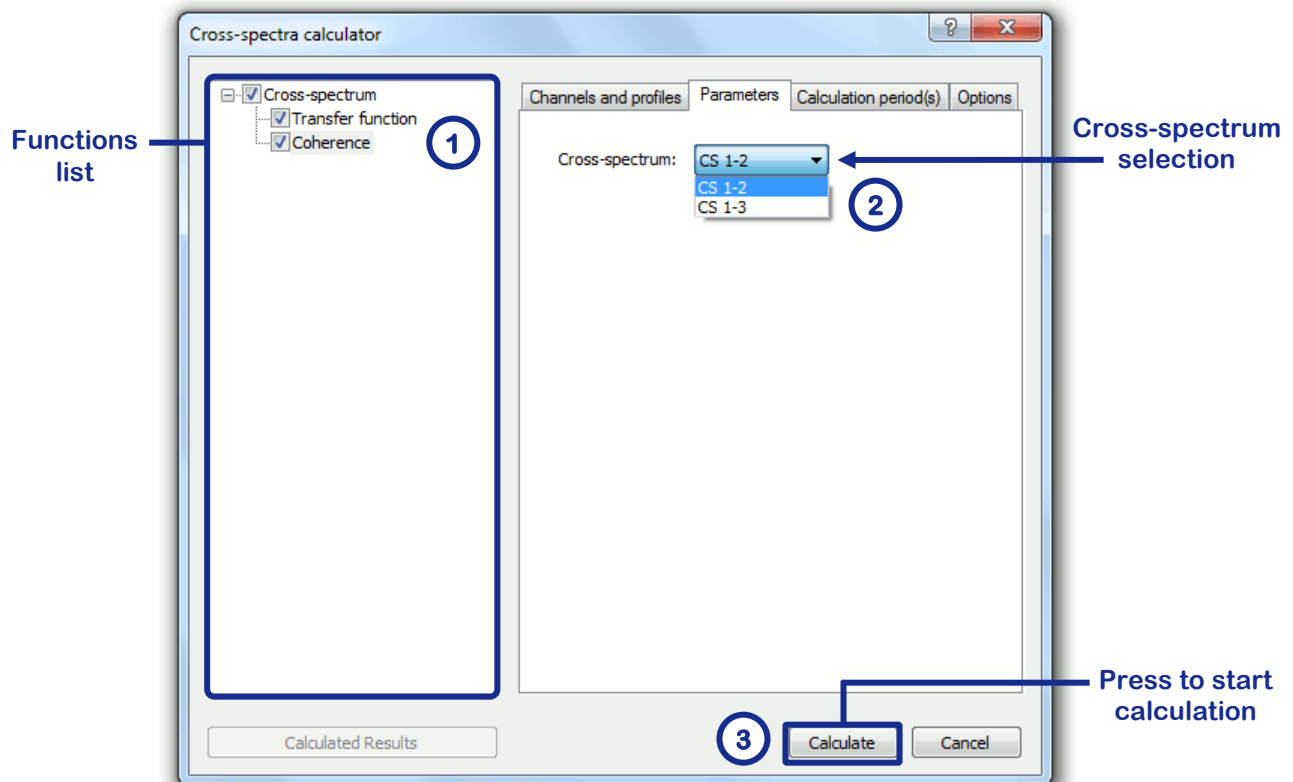


Fig.5.11. Calculator dialog box for *Cross-spectra* recalculations.

Calculation of functions available in the *Cross-spectra* sub-module proceeds similarly to the *Total RMS / LEQ* sub-module, the only difference being the selection of data made in the *Parameters* panel instead of the *Channels and profiles* panel.

1. Choose whether you wish to calculate the *Transfer function*, *Coherence* or both in the functions list at the left side of the *Cross-spectra calculator* dialog box.
2. In the *Parameters* panel select the cross-spectrum for which the calculations should be performed.
3. Press the *Calculate* button.

5.2.4 VIEWING CALCULATED RESULTS

When recalculation is done, the resulting functions are automatically displayed in the current view. They are also listed in the *View configurator*, allowing to hide and show them, where they can be recognized by "Calculated" added to their names (see Fig.5.12).

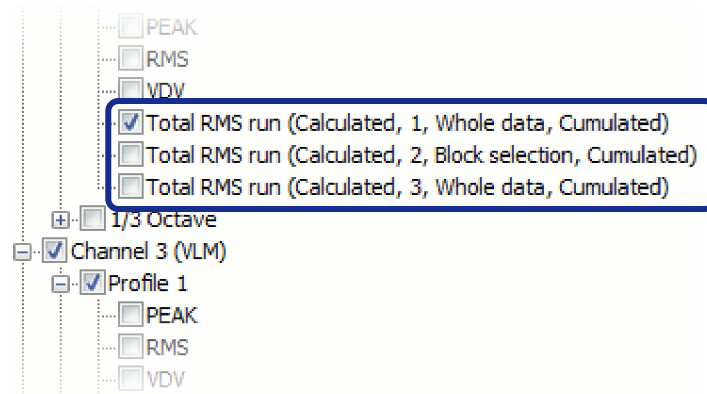


Fig. 5.12. View configurator list containing calculated functions.

In the *Plot view*, the calculated functions are listed in a separate table below the plot area, next to the *Functions* list. As with the other functions, you can decide whether to display them or not using the / icons.

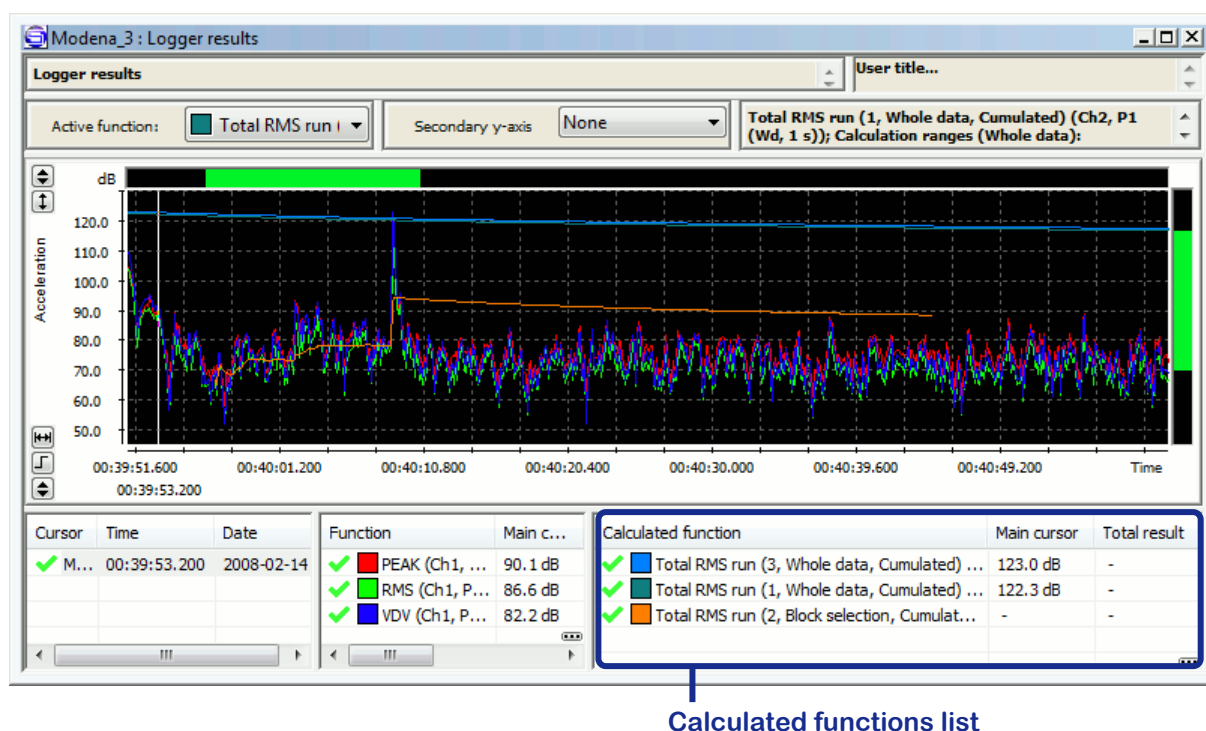


Fig.5.13. Plot view containing calculated functions.

Calculated results sub-window

To manage the results of calculations, you can use the *Calculated results* sub-window, which can be opened in two ways:

- Using the *Calculated results* button in the lower-left corner of the *Calculator* dialog box,
- Clicking twice on the name of a calculated function on the *Calculated functions* list in the *Plot view*.

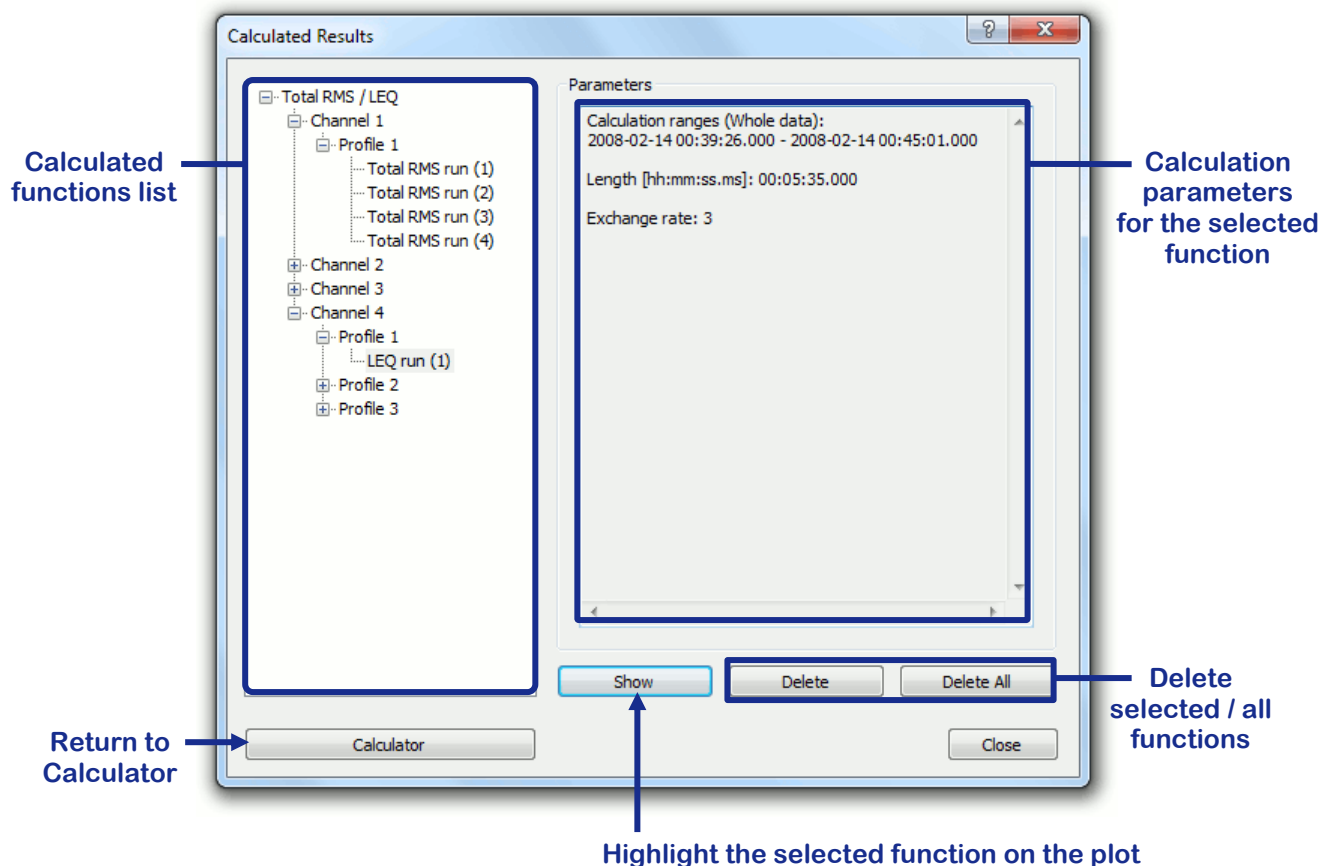


Fig.5.14. *Calculated Results* sub-window.

All the calculated functions are listed at the left side of the window, grouped by measurement channels and profiles.

You can select a function to view the parameters used for its calculation in the panel at the right side of the window.

You can also delete a selected function or all calculated functions using the *Delete* / *Delete All* buttons at the bottom of the window.

Pressing the *Show* button switches to the *Plot view*, closing the *Calculated Results* sub-window, and highlights the selected function so it can be recognized among all the plotted functions.

To close the *Calculated Results* sub-window and return to the *Calculator* tool, press the *Calculator* button located in the lower-left corner of the window.

6 DATA EXPORT

6.1 MS EXCEL

You can use the *Send to MS Excel* command to export the viewed data directly to an MS Excel worksheet:

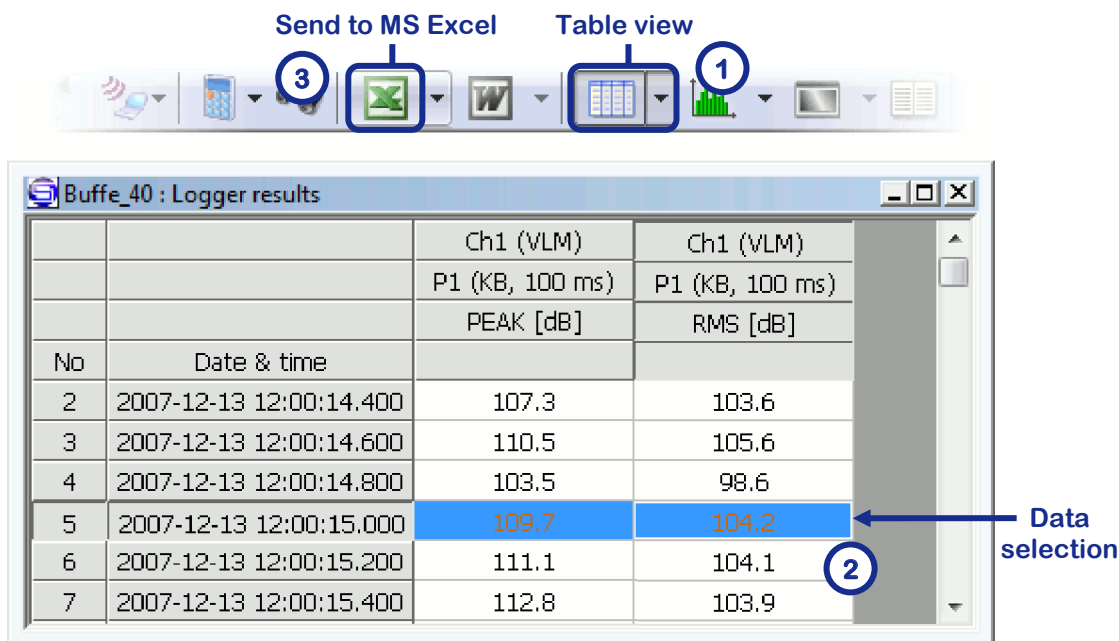


Fig.6.1. Exporting data from *Table view* to MS Excel.

1. Go to *Table view* by clicking on the  icon.
2. Select the data you wish to export.
3. Press the  /  button, located on the Main toolbar.
4. If you use this tool for the first time, the *Send To Microsoft Excel* dialog box will appear, allowing to configure the export settings.

In the panel on the left side of the *Send To Microsoft Excel* dialog box you can select the target MS Excel worksheet. All currently opened worksheets are displayed on the list. The *New Worksheet* option enables to create a new MS Excel worksheet for the exported data.

On the right side of the window you can decide whether the data should be inserted beginning from the first free column in the worksheet, from the first free row or from the currently selected cell. You can also decide whether table headers or the *Header information* should also be copied.

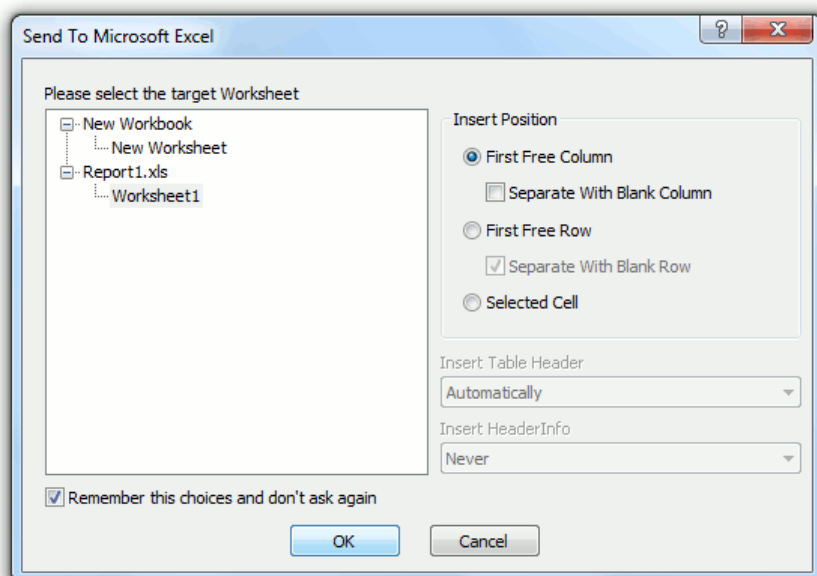


Fig.6.2. Configuration of data export to MS Excel settings.

If you enable the *Remember this choices and don't ask again* option, the next export will be done with the same settings and the *Send To Microsoft Excel* dialog box will not appear. The same can be obtained using the *Use Last Settings* command from the pulldown menu opened next to the  icon.

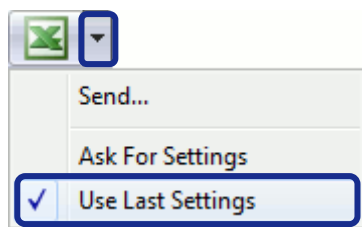


Fig.6.3. Saving the last settings for later data exports to MS Excel.



icon means that the settings have to be configured.



icon means that the last settings are remembered.

After the export, MS Excel will be automatically opened with selected data pasted to worksheet. In case the amount of data exceeds MS Excel rows or columns number limit, it will be split to more than one worksheet.

6.2 MS WORD

Results in text or picture form can be exported directly to MS Word:

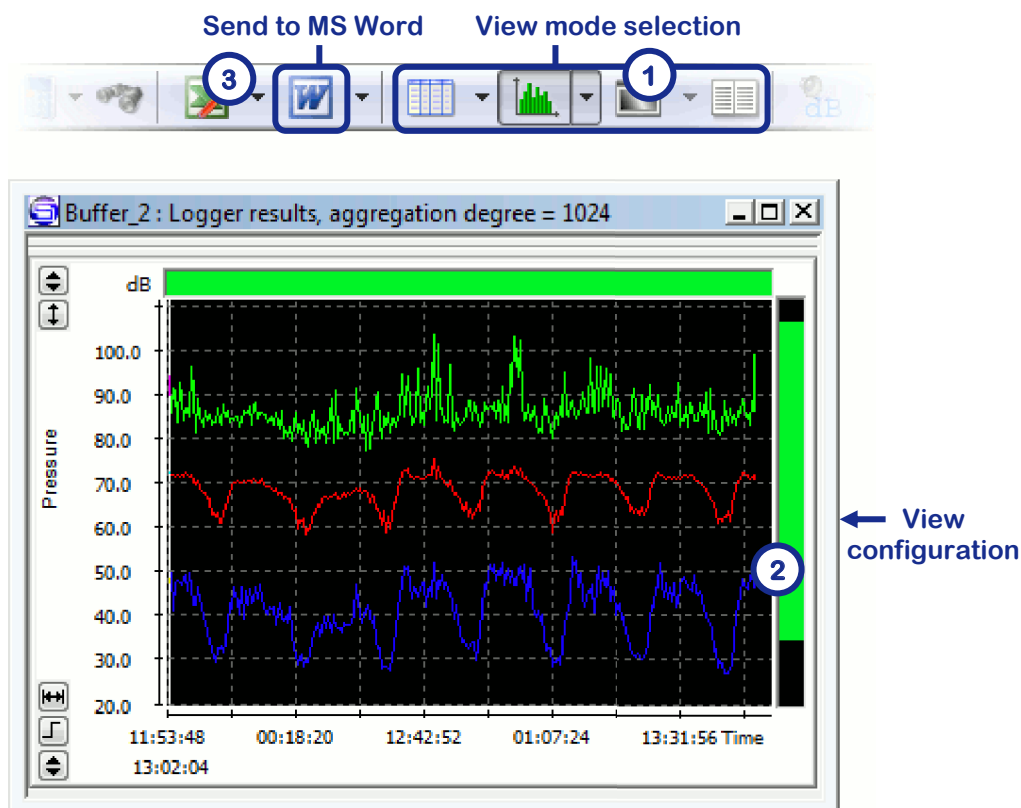


Fig.6.4. Exporting data from *Plot view* to MS Word.

1. Go to the desired view mode, e.g. *Plot* or *Table view*.
2. Configure the exported data:
 - a. In case of a table, select the cells to be exported.
 - b. In case of a plot, use the customisation tools as described in Chapter 4.2.2.: *Plot view* to obtain the optimal visualisation. The whole sub-window will be copied to MS Word unchanged, including tables below and above the plot area.
3. Press the  /  button, located on the Main toolbar.
4. If you use this tool for the first time, the *Send To Microsoft Word* dialog box will appear, allowing to configure the export settings.

Note: *Logger* and *Merged*-type views cannot be exported to MS Word in table form, only as plots. Pictures are exported as Windows meta-files.

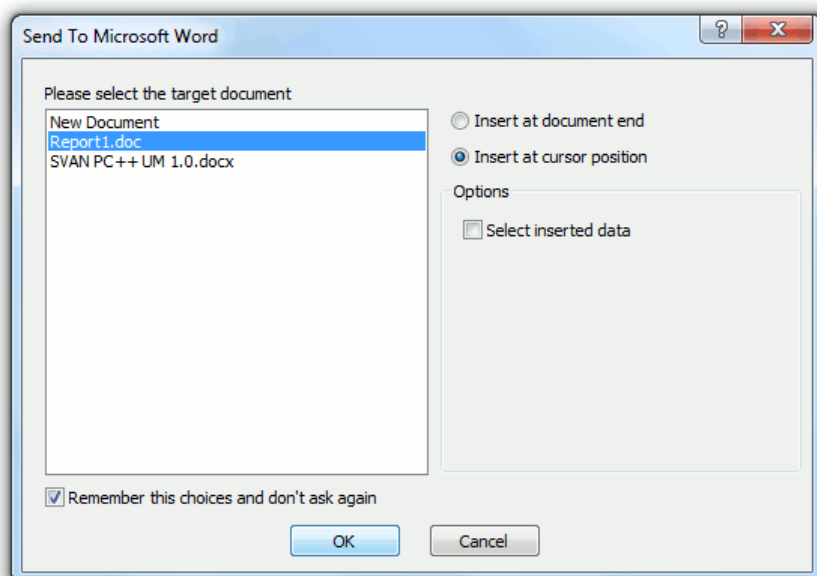


Fig.6.5. Configuration of data export to MS Word settings.

In the panel on the left side of the *Send To Microsoft Word* dialog box you can select the target MS Word document. All currently opened documents are displayed on the list. The *New Document* option enables to create a new MS Word document for the exported data.

On the right side of the window you can decide whether the data should be inserted below the current document contents (*Insert at document end*) or at the current position of the cursor in the opened document (*Insert at cursor position*). You can enable to automatically select the newly inserted data in MS Word (*Select inserted data*).

If you enable the *Remember this choices and don't ask again* option, the next export will be done with the same settings and the *Send To Microsoft Word* dialog box will not appear. The same can be obtained using the *Use Last Settings* command from the pulldown menu opened next to the  icon.

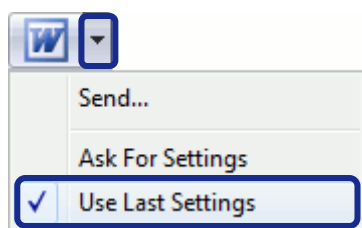


Fig.6.6. Saving the last settings for later data exports to MS Word.



icon means that the settings have to be configured.



icon means that the last settings are remembered.

After the export, MS Word will be automatically opened with selected data pasted to the selected document.

6.3 CSV FORMAT

SvanPC++ *Viewer* also supports the data export in CSV (*comma separated values*) format. To save the currently opened data in a .csv file, use the *Save Current View* command in the *File* menu. After activating this command, the *Save current view* dialog box will appear, enabling to select the name and location of the created .csv file.

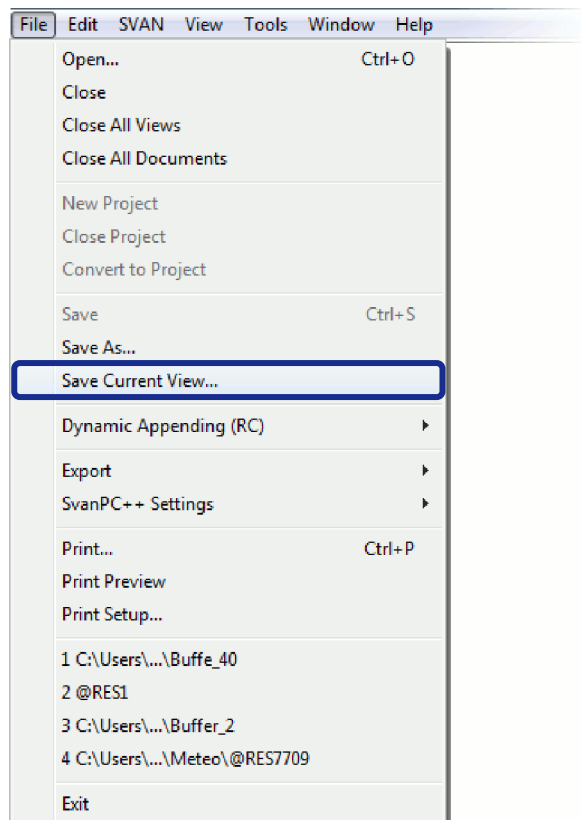


Fig.6.7. Exporting data in CSV format.

To configure the formatting of the exported CSV data, open the *Main Options* dialog box using the  button located on the Main toolbar or the *Main options* command from the *Tools* menu and go to *Formatting values* tab.

Note: These settings also affect the values display in SvanPC++ *Viewer*.

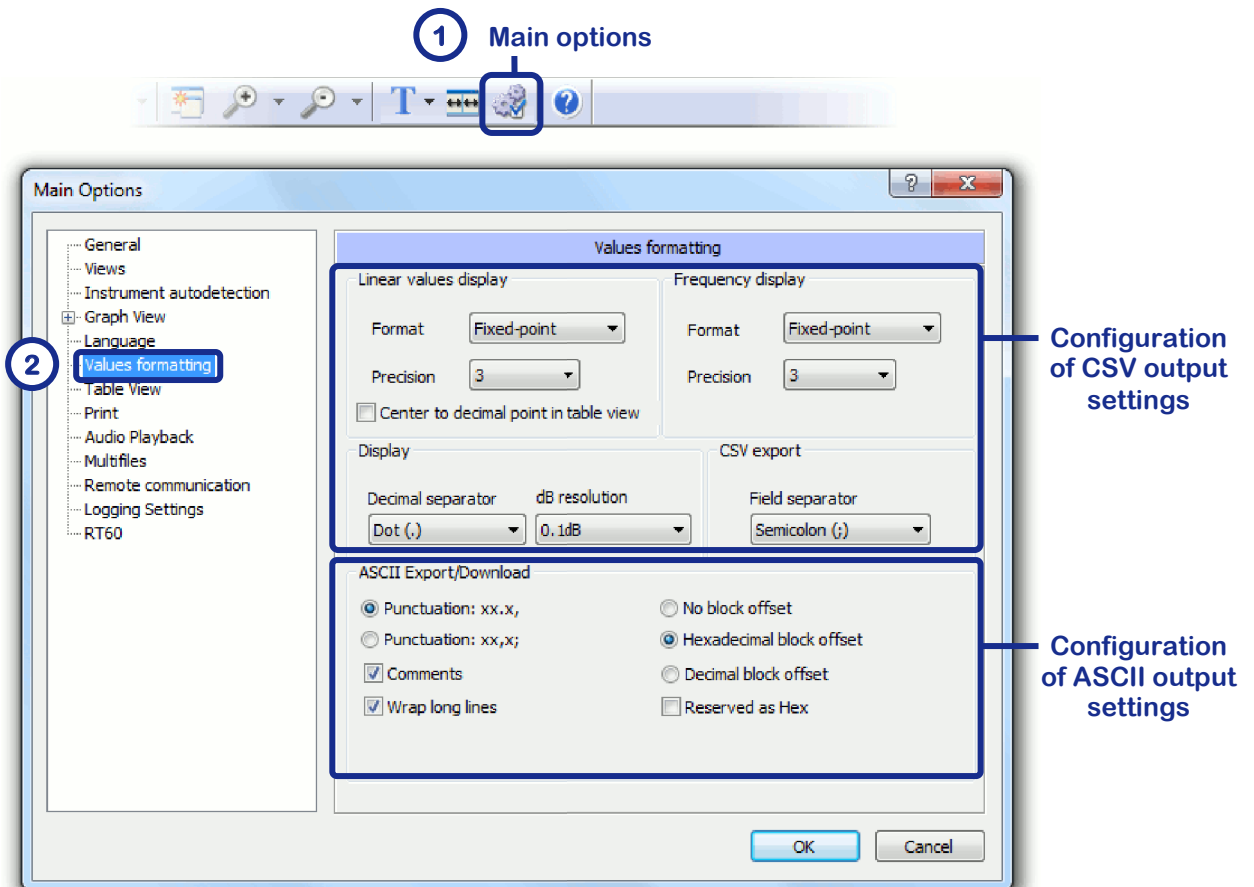


Fig.6.8. Configuration of the formatting of data exported as .csv files.

This dialog box enables the configuration of the following settings:

- Format (*Fixed-point* / *Scientific*) and precision (1-5) of the displayed linear and frequency values,
- Enable / disable the *Center to decimal point in table view* option,
Note: this option sets the location of linear values in cells so that the decimal point is located in the middle of the column. Otherwise the numbers are aligned horizontally in cells.
- Sign used as decimal separator in all displayed numbers (. / , / system default),
- Precision of displaying logarithmic values (*dB resolution*) as 0.1dB / 0.01dB.
Note: The display resolution does not affect the precision of calculations,
- Sign used as field separator in CSV output data (; / : / . / , / *tabulator* / *space*).

6.4 ASCII EXPORT

Data can also be exported according to ASCII standard as .csv files. To do so, use the *File » Export » ASCII Export » Export* command.

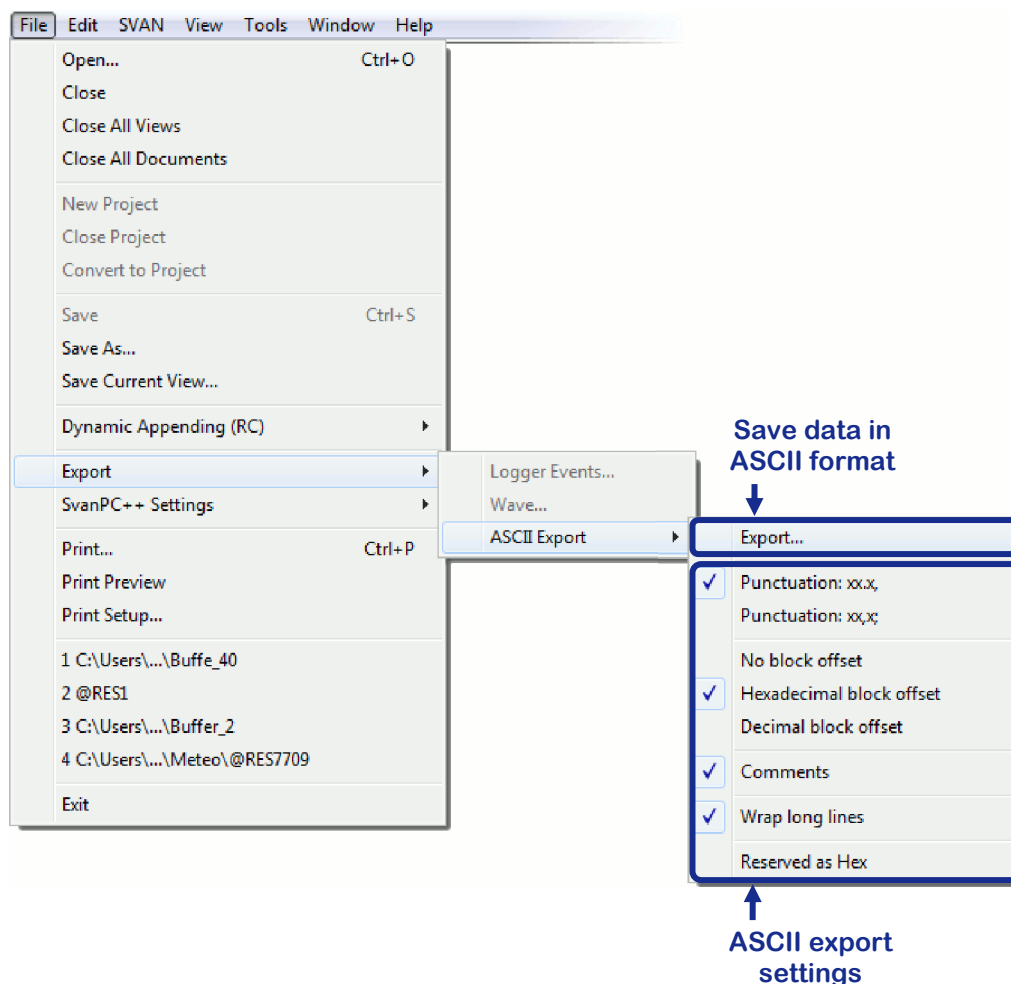


Fig.6.9. Exporting data in ASCII format.

In the *ASCII Export* pulldown menu the following settings are available:

- Punctuation signs: *dot* as decimal separator and *comma* as field separator or *comma* as decimal separator and *semicolon* as field separator,
- Block offset: *hexadecimal* / *decimal* / *none*,
Note: Displaying the offset may help to compare the data position in the file in binary and ASCII form.
- Allow to place comments or not in output ASCII file,
- Splitting long lines of data or leaving them unchanged (*Wrap long lines*)
- *Reserved as Hex* – present undocumented fragments of binary file in *hex* format or not.

The same settings can be configured in the *Values formatting* tab of the *Main Options* dialog box (see Fig.6.8).

6.5 AUDIO EXPORT

SvanPC++ supports exporting audio data in *WAV* file format. This includes exporting *Audio events* contained in the currently opened *Logger* data as well as wave data currently opened in the *Viewer*.

6.5.1 EXPORTING LOGGER EVENTS

To export events included in active logger view, use the *File » Export » Logger events* command.

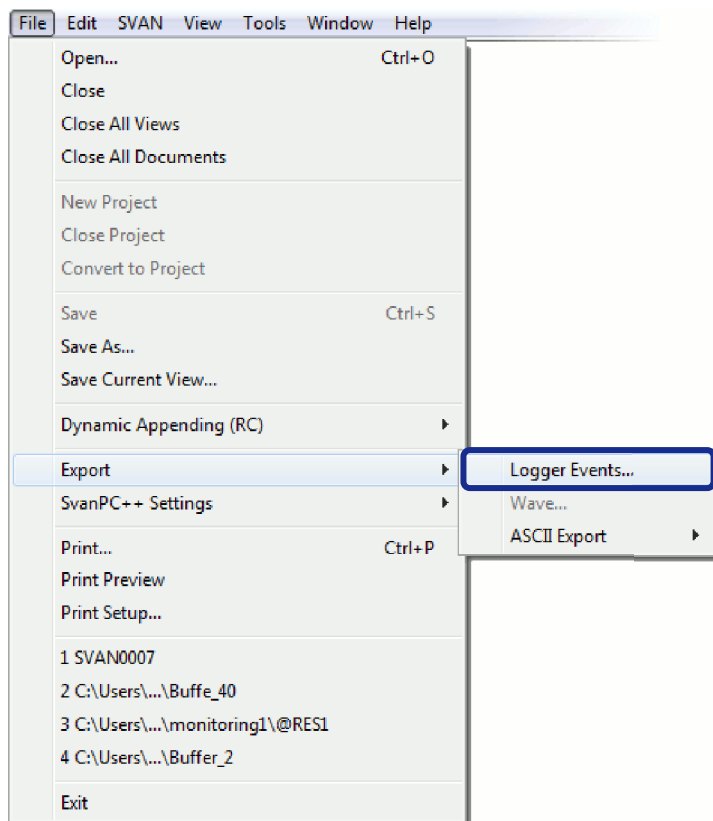


Fig.6.10. Exporting *Logger Events* as wave files.

After activating this command, the *Export Events* dialog box will appear. *Logger events* available in the current data are listed in the upper part of the window. You can set the target directory for the output wave files by clicking on the  icon next to the *Path* field.

To export the *Events* as *WAV* files, press the *Export* button located at the bottom of the window.

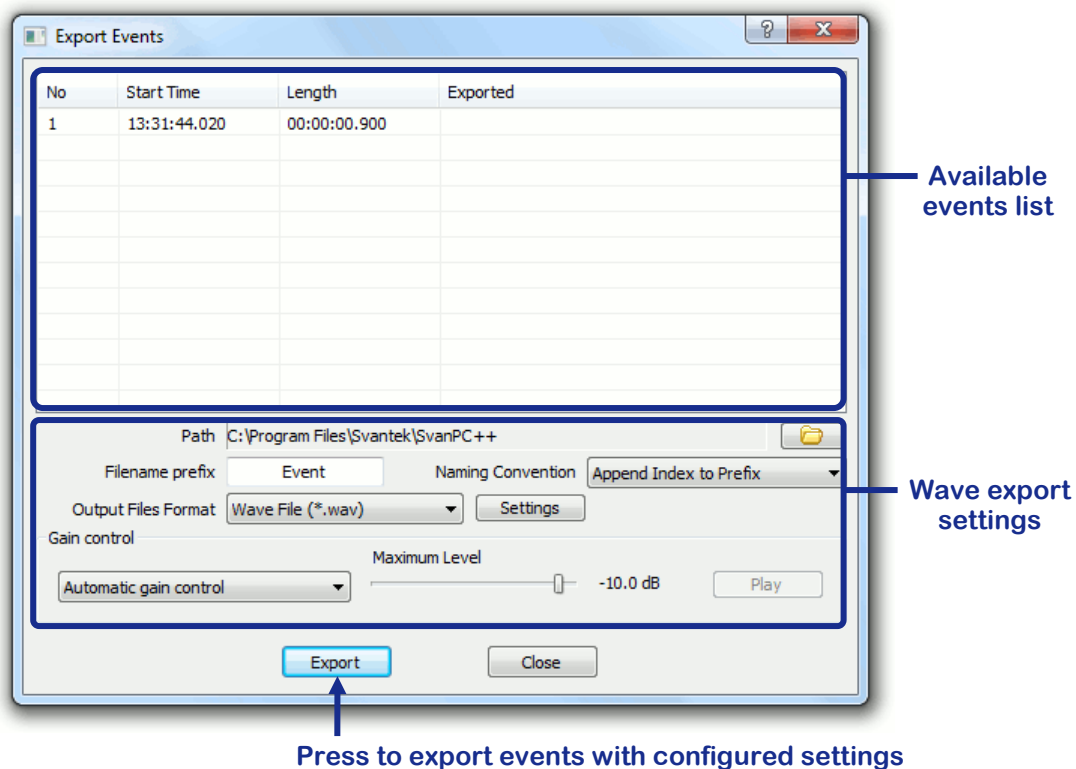


Fig.6.11. *Export Events* dialog box.

This dialog box also enables the configuration of following settings:

- *Filename prefix* – text string with which the output filename will start,
- *Naming convention* – select between appending the number of the event or its start time to the filename,
- *Output Files Format* – the format of created file,
Note: Currently only WAV file format is supported.
- *Settings* – wave parameters settings (*Compression*, *Sampling Rate [Hz]*, *Channels*, *Bits Per Sample*),
- *Gain control* – select whether to use no signal boost, constant-level signal boost or *Automatic gain control* smart signal boosting mechanism,
Note: Further information on SvanPC++ audio signal boosting can be found in Chapter 4.5.1.: *Events Navigator*.
- *Play* – playback of the last selected audio event.

6.5.2 EXPORTING WAVE FILES

To export .wav files from wave data opened in SvanPC++, use the *File » Export » Wave* command.

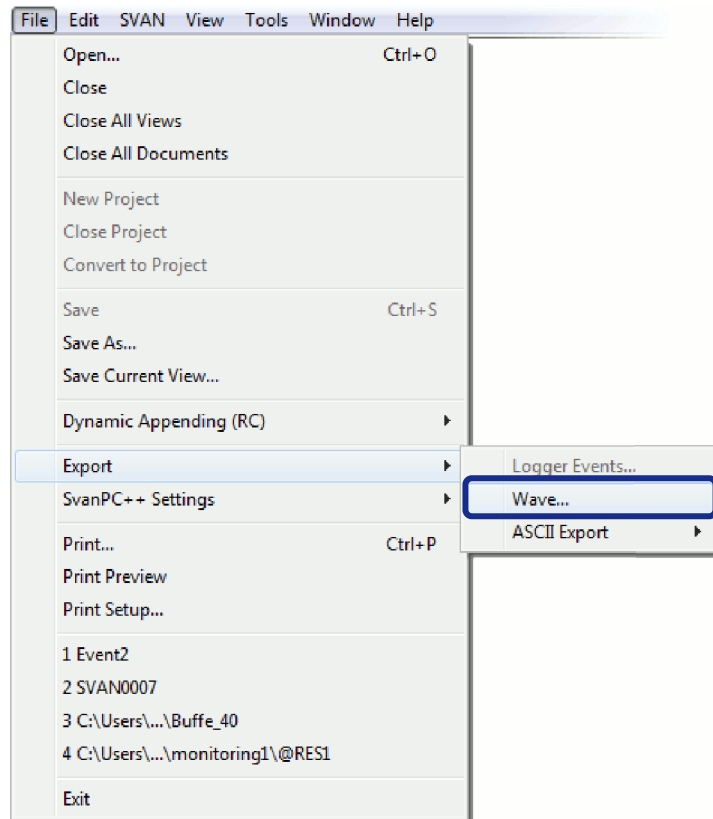


Fig.6.12. Exporting wave files.

After activating this command, the *Export wave* dialog box will appear. Audio channels available in the current data are listed in the upper-left part of the window. You can set the target filename and directory for the output wave files by clicking on the  icon next to the *Filename* field.

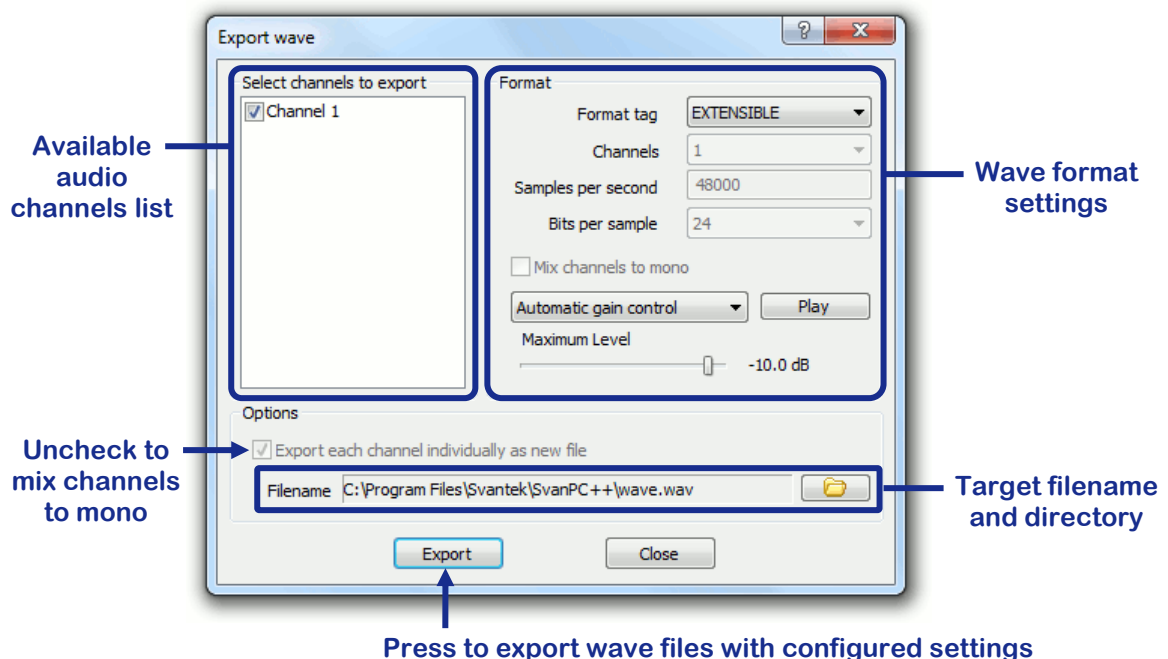


Fig.6.13. Export wave dialog box.

You can select a set of channels to be exported as well as *WAV* tag format. *EXTENSIBLE* format should be used, especially if *Bits per sample* parameter exceeds 16 bits, unless the device or software supposed to handle the exported files supports only standard PCM format.

You can also select whether to use no signal boost, constant-level signal boost or *Automatic gain control* smart signal boosting mechanism. Further information on SvanPC++ audio signal boosting can be found in Chapter 4.5.1.: *Events Navigator*.

Selected channels are by default exported to separate files. You can decide to mix all channels to one mono channel by unchecking the *Export each channel individually as new file* option.

To export the *wave* files, press the *Export* button located at the bottom of the window.

6.6 USING THE CLIPBOARD

Data can also be easily exported from SvanPC++ with the use of the *clipboard*.

6.6.1 COPYING TABLE VIEW CONTENTS

You can export the contents of *Table view* to a text editor application using the clipboard by doing the following:

1. Select the data you wish to export in the *Table view*.
2. Press the right mouse button to open a pulldown menu.
3. Choose *Copy* or *Copy with headers* command.
4. Go to the text editor application and use the *Paste* command.

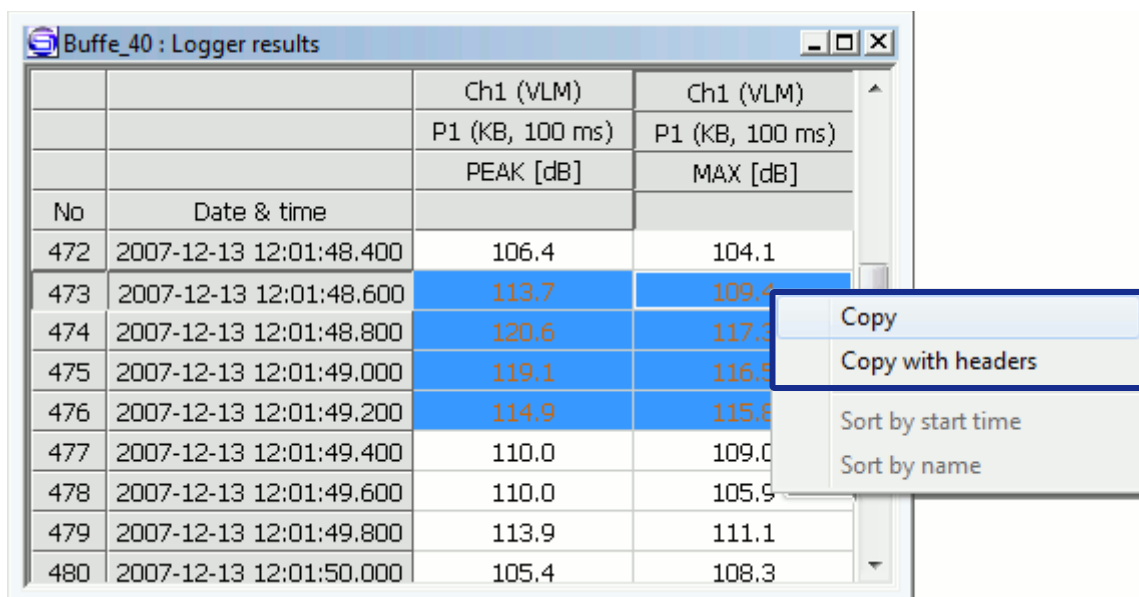


Fig.6.14. Copying the *Table view* contents using the clipboard.

The *Copy with headers* option includes the header cells, marked with grey color, in the copied data.

6.6.2 COPYING TEXT VIEW CONTENTS

Contents of a *Text view* can be easily copied directly to a text editor application by doing the following:

1. Selecting the data to copy.
2. Clicking on it with the left mouse button.
3. Drag the selection without releasing to the text editor application.
4. Drop the selection in the target document.

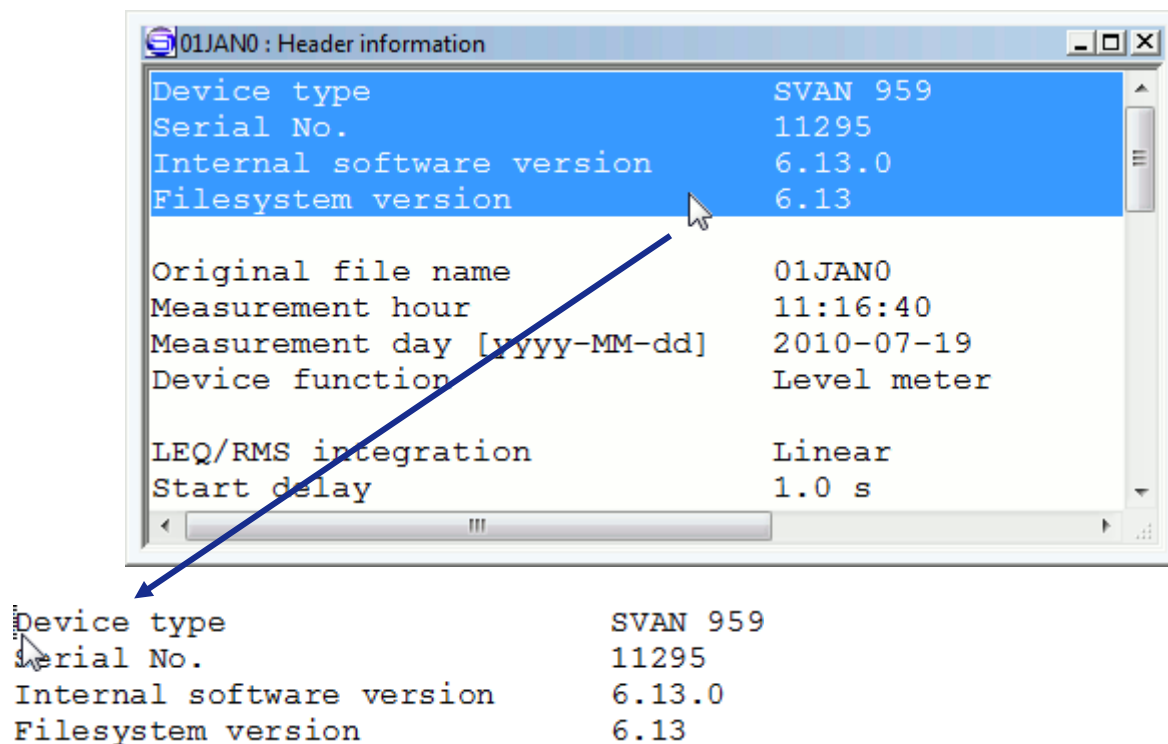


Fig.6.15. Using the *drag & drop* technique to export the contents of *Text view*.

7 OTHER FEATURES

7.1 MAIN TOOLBAR CUSTOMISATION

The *Main toolbar* is displayed at the top of the SvanPC++ application window, below the menu bar. It provides quick access to many tools used in SvanPC++. To hide / show the Main toolbar, use the *View » Toolbar* command.

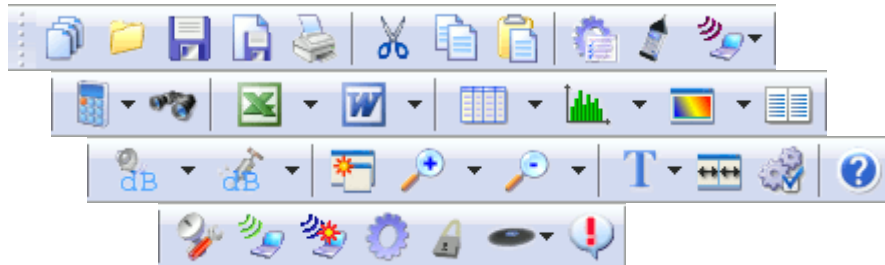


Fig.7.1. Main toolbar buttons.

It is possible to choose the buttons displayed on the toolbar with the use of the *Toolbar configurator* dialog box. It can be activated in two ways:

- Using the *Tools » Customize toolbar* command,
- Clicking twice with the *right* mouse button in the Main toolbar area.

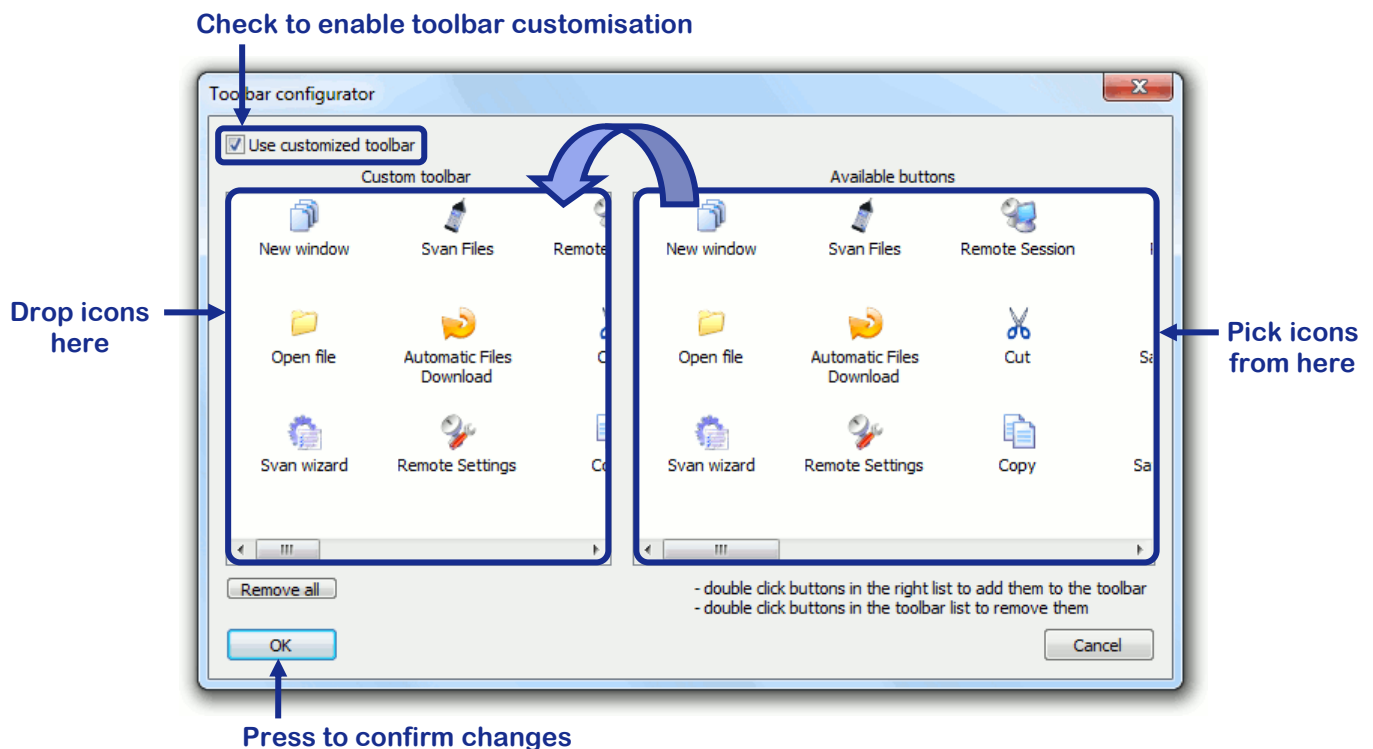


Fig.7.2. *Toolbar configurator* dialog box.

To use a custom selection of toolbar buttons, enable the *Use customized toolbar* option, using the checkbox located at the upper-left corner of the

Toolbar configurator window. To use the default configuration, uncheck this option.

To select buttons, you can use one of two following methods:

- Drag-and-drop icons from the *Available buttons* list located at the right side of the window to the *Custom toolbar* list located at the left side of the window, as illustrated in Fig.7.2.
- Double-click on an icon in the *Available buttons* list to add it to the custom toolbar, or double-click on an icon in the *Custom toolbar* list to remove it.

Note: Different toolbar configurations are used when a document is currently opened and when there are no opened documents in SvanPC++. You can customise both toolbar configurations separately. You can also use default settings for one of the configurations and custom settings for the other.

All buttons available to display in the Main toolbar are described in Table 7.1.

Table 7.1. Main toolbar buttons.

<i>Icon</i>	<i>Name</i>	<i>Function</i>
	<i>New Window</i>	– Creates a new view sub-window with the same contents as the one currently active.
	<i>Open</i>	– Opens a chosen document.
	<i>Save</i>	– Saves an opened document.
	<i>Save Current View</i>	– Exports the currently active view in CSV format.
	<i>Print</i>	– Prints a document.
	<i>Cut</i>	– Deletes selected data and moves it to the clipboard.
	<i>Copy</i>	– Copies selected data to the clipboard.
	<i>Paste</i>	– Inserts data from clipboard.
	<i>Instrument wizard</i>	– Shows / hides the <i>Instrument wizard</i> dialog box.

	<i>SVAN Files</i>	– Opens the <i>SVAN Files</i> dialog box.
	<i>RC Module group</i>	– Enables to access <i>SVAN Files</i> , <i>Remote Communication Center</i> and <i>Connection Configuration</i> .
	<i>Calculator</i>	– Enables to access <i>Calculator</i> sub-modules.
	<i>Data search</i>	– Opens the <i>Data search</i> dialog box (only available if <i>Svan Projects</i> are activated)
	<i>Send to MS Excel</i>	– Enables to export data to an MS Excel worksheet.
	<i>Send to MS Word</i>	– Enables to export data to an MS Word document.
	<i>Table</i>	– Switches the current view to <i>Table</i> mode.
	<i>Plot</i>	– Switches the current view to <i>Plot</i> mode.
	<i>Spectrogram</i>	– Switches the current view to <i>Spectrogram</i> mode.
	<i>Text</i>	– Switches the current view to <i>Text</i> mode.
	<i>Change SLM units</i>	– Enables to choose units for displaying SLM results.
	<i>Change VLM units</i>	– Enables to choose units for displaying VLM results.
	<i>View Configuration</i>	– Shows / hides the <i>View configurator</i> .
	<i>Zoom plus</i>	– Decreases the number of samples per pixel.
	<i>Zoom minus</i>	– Increases the number of samples per pixel.
	<i>Table Font Size</i>	– Enables to adjust the size of numbers displayed in <i>Table view</i> .



AutoSize columns

- Automatically sets the column widths in *Table view*.



Main options

- Opens the *Main options* dialog box.



About SvanPC++

- Displays information about the used version of SvanPC++.



Remote settings

- Enables to establish connection type and communication mode between SvanPC++ and a SVAN unit.



*Remote
Communication
Center*

- Opens the *Remote Communication Center* dialog box.



*Remote Connection
Wizard*

- Opens a Wizard enabling to easily configure the connection.



*SV 100/101
calibration*

- Enables to calibrate a SV100/101 unit connected to PC via USB.



*SV 100/101 Options
Configurator*

- Enables to configure the settings of a SV100/101 unit connected to PC via USB.



SV 100/101 group

- Enables to access the *SV100/101 calibration* and the *SV100/101 Options Configurator*.



Alarms/status

- Opens the *Alarms/status* sub-window.

7.2 SHORTCUT KEYS

The key combinations available in SvanPC++ are listed in Table 7.2.

Table 7.2. Shortcut keys in SvanPC++.

<i>Key combination</i>	<i>Function</i>
<i>CTRL + C</i>	– Copy selection.
<i>CTRL + V</i>	– Paste from clipboard.
<i>CTRL + Z</i>	– Undo last action.
<i>F1</i>	– Access help.
<i>CTRL + P</i>	– Print.
<i>CTRL + O</i>	– Open a file.
<i>Left ALT + F, E, ...</i>	– Access to menus (<i>F – File, E – Edit</i> etc.).
<i>Shift + F1</i>	– Enables to use the mouse to open help page related to a selected control.
<i>CTRL + F6</i>	– Show next opened sub-window.
<i>ESC</i>	– In <i>Plot view</i> , delete the block selection containing the current position of the Main cursor / delete the only existing block selection / delete all block selections.

7.3 ACCESSING ADDITIONAL MODULES

Except of the free *Viewer* module, the SvanPC++ software suite comprises several additional modules available for purchase, such as:

- SvanPC++ Remote Communication
- SvanPC++ Environmental Monitoring
- SvanPC++ Dose Measurements
- SvanPC++ Building Acoustic

There are two ways of activating SvanPC++ additional modules:

- Entering an *activation code*,
- Using a *hardware dongle*.

7.3.1 RC MODULE ACTIVATION

The *Remote Communication Module* is licensed separately for each SVAN instrument. To access this module, you have to purchase an *activation code* for each instrument you wish to use with *SvanPC++_RC* and enter it in the *Enter Activation Keys* window in the SvanPC++ application.

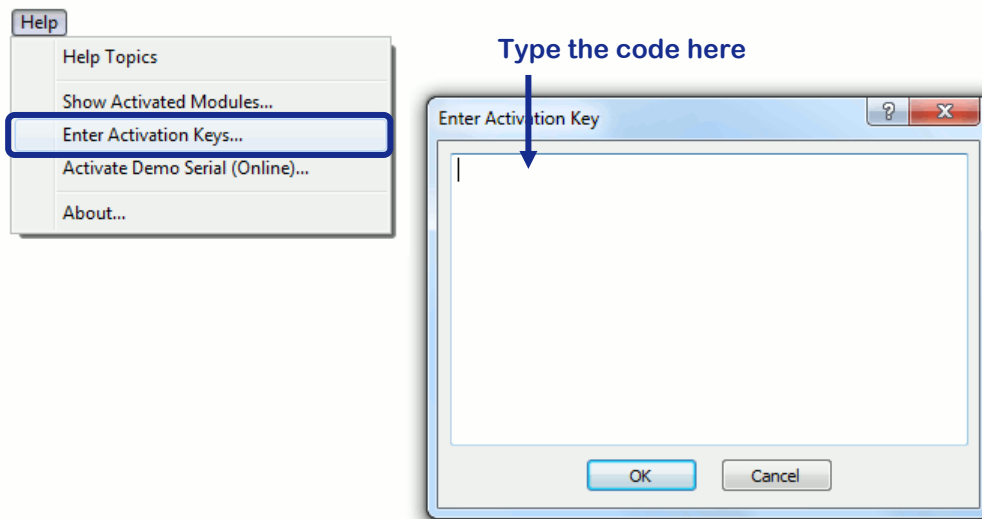


Fig.7.3. Entering codes for *RC Module* activation.

7.3.2 HARDWARE DONGLES

The *EM*, *DM* and *BA* modules can be activated with the use of hardware dongles.



Fig.7.4. A hardware dongle.

The dongles contain keys which serve to activate additional SvanPC++ modules. When you plug a dongle to a USB port of your computer, the key is automatically unpacked and you gain access to the modules. Removing the dongle will block the access to the modules.

There can be multiple modules activated with one dongle.

Keys contained in the dongle are connected with its serial number. Therefore, a key copied from the dongle will not work without the dongle being plugged into the computer.

Note: If after plugging in the dongle you still do not have access to the additional modules, this might be due to an older version of SvanPC++ being previously installed on your computer. It is then necessary to first uninstall SvanPC++ and then install the newest version of the software, available on the Svantek website.

8 ENVIRONMENTAL MONITORING MODULE TOOLS

SvanPC++ Environmental Monitoring is an additional module of the *SvanPC++* software suite, designed for processing data from noise or vibration measurements, including long period unattended environmental monitoring.

The *EM Module* enriches the *SvanPC++* software with the following features:

- Advanced recalculation tools,
- Data management in form of measurement projects,
- Saving analysis results and data views,
- Tools for reporting, including templates,
- Advanced data comparison tools.

8.1 ENVIRONMENTAL CALCULATOR

SvanPC++ Environmental Monitoring provides tools for the assessment of noise, concerning recalculations based on measurement results. In this chapter the functions available for recalculation will be considered. Methods of using the advanced recalculation tools are described in Chapter 9.: *SvanPC++ Calculator Tool*.

8.1.1 SPECIFIC NOISE ASSESSMENT

The *Environmental Monitoring Calculator* sub-module provides several tools for specific noise assessment.

Peak and harmonics detection

The detection of peak and harmonics in FFT data is provided by the *Peak detection* and *Harmonic detection* functions in the *Result FFT* group of the *EM Calculator*.

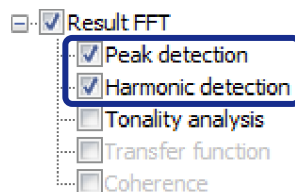


Fig.8.1. Peak and harmonics detection functions on the *Calculator* functions list.

These two functions are available for recalculation only if *FFT Result* – type data is available in the currently opened file.

Note: Harmonic detection will be performed using main cursor position as the starting point. It is advised to first perform peak detection, then place main cursor at the desired peak and launch harmonic detection calculation.

You can adjust the *Peak / Harmonic detection criterion* between 1dB and 30dB.

Tonality analysis

The tonality analysis is provided in the *EM Calculator* in two modes:

- for *FFT* data – the *Tonality analysis* function in the *Result FFT* group
- for *1/3 octave* data – the *Tonality analysis (Simple)* function in the *Result 1/n octave* group.

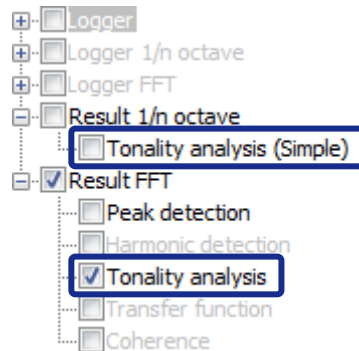


Fig.8.2. Tonality analysis functions on the *Calculator* functions list.

The *Tonality analysis* function enables the assessment of tonality in selected FFT data with selected criterion. As a result of calculations, a dialog box will appear containing information about the necessary penalty factor. In case of this function the following parameters are available for configuration:

- Standard: *Nordic* (according to ISO 1996-2:2002 standard) or *German*
- Maximum tone bandwidth: 5 % - 25 %
- Tone seek criteria: 1 dB – 5 dB
- Regression range: 0 – 100 %
- Tone bandwidth: 1 dB – 6 dB.

The *Tonality analysis (Simple)* function enables the assessment of tonality in selected 1/3 octave data. As a results of calculations, a dialog box will appear containing information about the audible tones found. In case of this function, no parameters are necessary to configure.

Impulsivity analysis

The impulsivity of a *logger*-stored signal can be evaluated with the use of the *Impulse analysis* function from the *Logger* group.

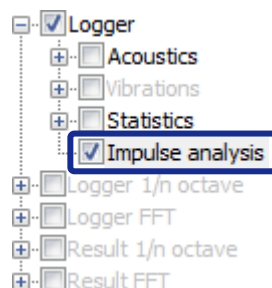


Fig.8.3. Impulsivity analysis function on the *Calculator* functions list.

The recalculation is performed according to the norm UNI/BS 9432:2002 on the basis of measured *MAX* function. As a result of calculations, a dialog box will appear containing information about the impulsivity of the evaluated signal.

To enable the *Impulse analysis* recalculation, the following requirements must be fulfilled:

- The analysed *Logger* file must contain *MAX* function measurement results.
- The measurement must be conducted in 3 profiles with the use of following detector types: *Fast*, *Impulse* and *Slow*.
- The logger step must be smaller than 1 s.

No additional parameters are available to configure in case of this function.

8.1.2 GENERAL NOISE ASSESSMENT

Except of the specific noise assessment, the *Environmental Monitoring Calculator* provides also tools for general noise assessment.

LEQ – Equivalent Continuous Sound Level

The total *Equivalent continuous sound level* value in a given period can be calculated on the basis of *LEQ* measurement results according to the formula:

$$LEQ_k^{tot} = 10 \log \left(\frac{1}{k} \sum_{i=1}^k 10^{LEQ_{k/10}} \right) \quad (8.1)$$

k – sample index in given set of data.

This is realised by the *LEQ* function from the *Logger » Acoustics* group.

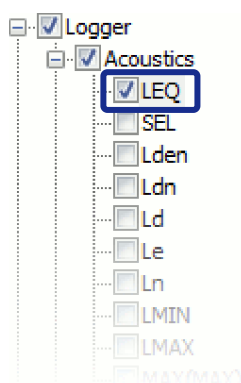


Fig.8.4. LEQ function on the *Calculator* functions list.

The *EM Calculator* provides various types of *LEQ* recalculations, such as:

- Total / spectral (averaging),
- In intervals,
- Finding max and min levels,
- Statistical levels,

The spectral LEQ is available in the *Logger 1/n octave » Acoustics* group. In the *Parameters* settings for this function you can choose whether to calculate the 1/1 octave or 1/3 octave spectrum.

Note: In case of spectral logger-based calculations, the calculation is performed separately for each logged frequency. Calculating a spectral function automatically opens a *1/3* or *1/1 octave logger recalculated* sub-window containing the calculation results.

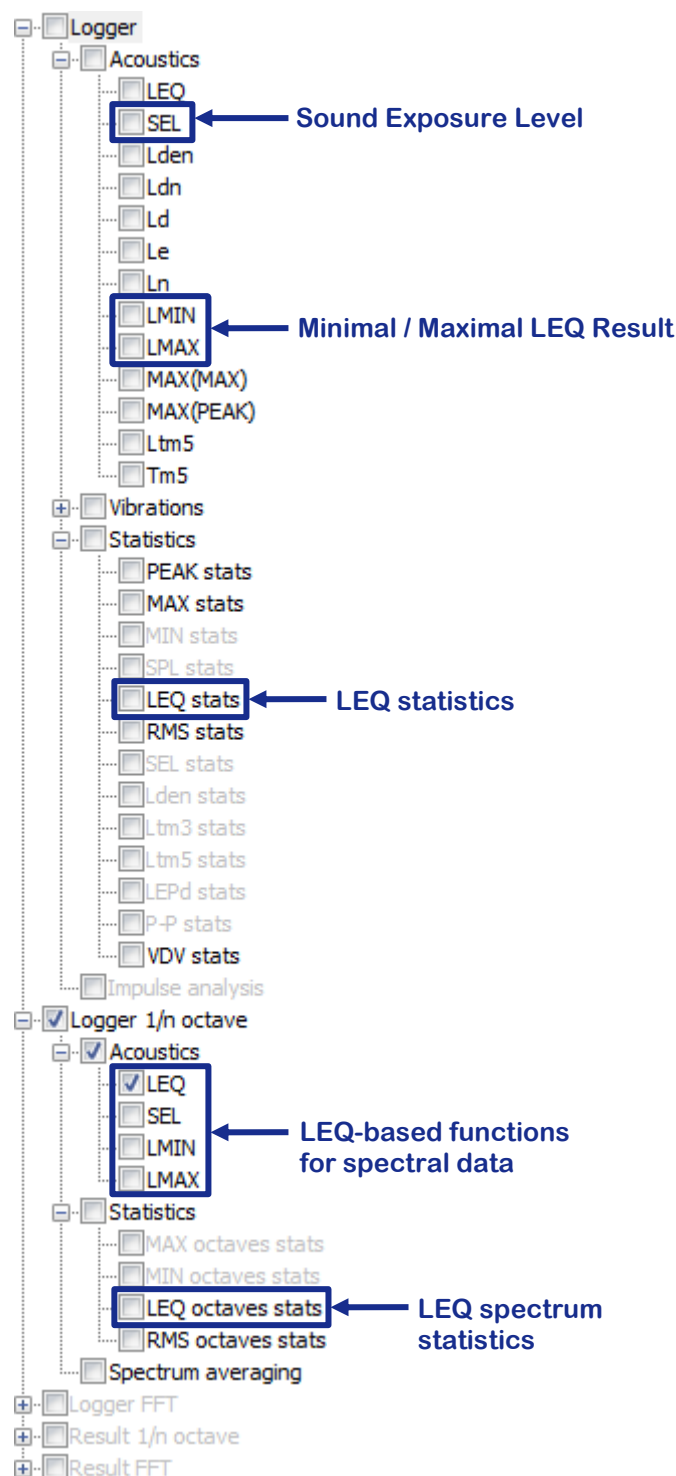


Fig.8.5. LEQ-based functions on the *Calculator* functions list.

SEL – Sound exposure level

The *SEL* result is essentially a subset of the *LEQ* function.

$$SEL_k = LEQ_k + 10 \log \left(\frac{T_k[s]}{1[s]} \right) \quad (8.2)$$

k – sample index in given set of data.

T_k – measurement time.

It is possible to calculate the *SEL* function in intervals by setting the start and stop time of the calculation period, using the *Calculate in selected time period* option in the *Parameters* panel.

The *SEL* function is available in the *Logger » Acoustics* group. For spectral data it can also be calculated using the *SEL* function from the *Logger 1/n octave » Acoustics* group.

Maximal and Minimal LEQ result

You can recalculate the highest and lowest *LEQ* level within the measuring period using the *LMAX* and *LMIN* functions, correspondingly, which are available in the *Logger » Acoustics* group.

These functions are also available for spectral data under the same names in the *Logger 1/n octave » Acoustics* group. In case of spectral *LMIN* and *LMAX*, the choice between 1/1 octave and 1/3 octave spectrum is available in the *Parameters* panel. Minimum / maximum values will be found across the calculation range independently for each frequency band.

Statistics

Statistics may be calculated for several logger- or multifile-type functions. All available statistical recalculations are listed in the *Logger » Statistics* group and in the *Logger 1/n octave » Statistics* group in case of spectral data. For example, you can use the *Logger » Statistics » LEQ stats* function to obtain *LEQ* calculation results statistics.

Calculating a *Statistics*-type function automatically opens a *Statistics logger recalculated* sub-window containing the calculation results. The statistical results can viewed in two modes:

- *Histogram* mode presents the percentage participation of each dB level in the given function values at 1 dB resolution.
- *LN* mode has the following interpretation: x% of samples have values equal or greater than the *LNx* value.

In case of spectral statistics, *LN(f)* mode of view is also available, as described in the *Statistical Views* section of Chapter 4.3.2.: *View sub-windows types*.

LEQ Averaged Spectrum

To calculate the time-averaged spectrum of selected *LEQ* data, use the *Spectrum averaging* function from the *Logger 1/n octave* group. You can choose between averaging the 1/1 octave and 1/3 octave spectrum.

This function is available only for files containing spectral data in multiple time points such as *Logger* or *Merged* spectral data. It is not available for *Results* files.

Day / Evening / Night level functions

The L_d , L_e , L_n , L_{dn} and L_{den} functions are descriptors of noise level based on the *LEQ* results for the day, evening, night, day-night and day-evening-night periods correspondingly, with penalty factors for particular parts of day. They can be accessed in the *Logger » Acoustics* group.

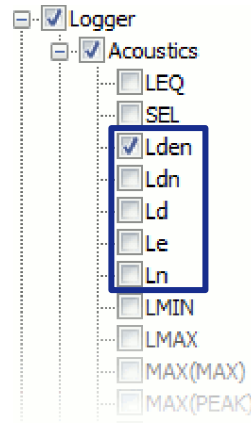


Fig.8.6. L_{den} family of functions on the *Calculator* functions list.

$$L_{den_k} = \begin{cases} LEQ_k + p_k & \text{for } k = 1 \\ 10 \log \left[\frac{1}{k} \left(\sum_{n=1}^{n=k-1} 10^{\frac{L_{den_n}}{10}} + 10^{\frac{LEQ_k}{10}} \right) \right] + p_k & \text{for } k > 1 \end{cases} \quad (8.3)$$

$$p_k = \begin{cases} 0 & \text{for } t_k \in (T_d, T_e) \\ p_e & \text{for } t_k \in (T_e, T_n) \\ p_n & \text{for } t_k \in (T_n, T_d) \end{cases} \quad (8.4)$$

$$L_{d_k} = 10 \log \left(\frac{1}{k} \sum_{1}^k 10^{\frac{LEQ_k}{10}} \right) \quad \text{for } t_k \in (T_d, T_e) \quad (8.5)$$

$$L_{e_k} = 10 \log \left(\frac{1}{k} \sum_{1}^k 10^{\frac{LEQ_k}{10}} \right) + P_e \quad \text{for } t_k \in (T_e, T_n) \quad (8.6)$$

$$L_{n_k} = 10 \log \left(\frac{1}{k} \sum_{1}^k 10^{\frac{LEQ_k}{10}} \right) + P_n \quad \text{for } t_k \in (T_n, T_d) \quad (8.7)$$

T_d – day-time start point,
 T_e – evening-time start point,
 T_n – night-time start point,
 p_e – evening-time penalty,
 p_n – night-time penalty,
 k – sample index in given set of data,
 t_k – k -sample measurement time.

In the *Parameters* panel for L_{den} family functions you can adjust the values of following parameters:

- Day-time start point [hh:mm:ss],
- Evening-time start point [hh:mm:ss],
- Night-time start point [hh:mm:ss],
- Evening-time penalty factor [dB],
- Night-time penalty factor [dB].

Note: Start points of the day parts are given in *absolute* time, independently of *Main options* settings.

If the *Calculate in intervals* option is enabled, the common part of the intervals and the selected day parts will be used for recalculation. For details on calculation in intervals, see Chapter 9.2.: *Specifying calculation periods*.

You can also choose to calculate the described functions using a specified reference time. This option is particularly useful if you perform calculations on a shorter range of the time domain.

If the *Calculate using reference time* option is enabled, the recalculation consists of the following steps:

1. LEQ is calculated for separate events, selected by the user with blocks or markers.
2. Calculations are performed according to the following formulae:

$$L_d = 10 \log \left[\frac{1}{T_{Rd}} \sum_{j=1}^{n_d} t_j 10^{0.1 L_{AEj}} \right] \quad (8.8)$$

$$L_e = 10 \log \left[\frac{1}{T_{Re}} \sum_{j=1}^{n_e} t_j 10^{0.1 (L_{AEj} + p_e)} \right] \quad (8.9)$$

$$L_n = 10 \log \left[\frac{1}{T_{Rn}} \sum_{j=1}^{n_n} t_j 10^{0.1 (L_{AEj} + p_n)} \right] \quad (8.10)$$

$$L_{den} = 10 \log \left[\frac{1}{T_{Rd}} \sum_{j=1}^{n_d} t_j 10^{0.1 L_{AEj}} + \frac{1}{T_{Re}} \sum_{j=1}^{n_e} t_j 10^{0.1 (L_{AEj} + p_e)} + \frac{1}{T_{Rn}} \sum_{j=1}^{n_n} t_j 10^{0.1 (L_{AEj} + p_n)} \right] \quad (8.11)$$

T_{Rd} – reference time (day)
 T_{Re} – reference time (evening)
 T_{Rn} – reference time (night)
 L_{AEj} – *LEQ* for event j
 t_j – duration time of event j
 n_d – number of events in day-time
 n_e – number of events in evening-time
 n_n – number of events in night-time

If recalculation is performed in intervals, for each interval the calculations are performed independently with specified reference time.

Ltm5, Tm5 – Takt-Maximum levels

The *Ltm5* and *Tm5* functions in the *Logger » Acoustics* group allow to calculate the Takt-Maximum levels according to German standard TA Lärm.

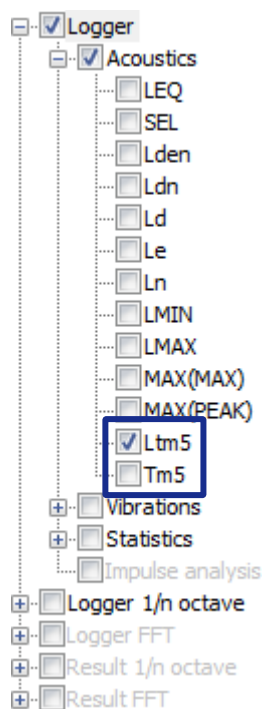


Fig.8.7. Takt-Maximum level functions on the *Calculator* functions list.

The calculations are performed in 5-seconds time intervals, beginnings from the file start, independently on the intervals set in the *Calculation periods* settings.

The *Ltm5* and *Tm5* values are calculated only for ranges of data where the whole 5-second period is selected for calculation. If a part of a period is not contained within the selection, calculation for a period of length < 5 s will never be performed.

Maximal value calculation

It is possible to calculate the maximal value of functions measured by the SVAN instruments, such as *MAX* and *PEAK*, with the use of *MAX(MAX)* and *MAX(PEAK)* functions from the *Logger » Acoustics* group, accordingly. These functions simply return the maximal value of given results.

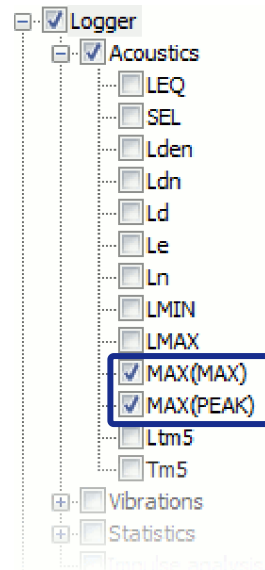


Fig.8.8. Maximal value functions on the *Calculator* functions list.

8.1.3 VIBRATION MEASUREMENTS BASED CALCULATIONS

RMS-based calculations

The averaged *RMS* value for a vibration measurement signal can be calculated using the *Total RMS* function in the *Logger » Vibrations* group. It is analogous to the *LEQ* function in case of acoustic measurements.

The maximal and minimal *RMS* value can be calculated with the use of *LMIN* and *LMAX* functions from the *Logger » Vibrations* group in an analogous way as in case of *LEQ*-based calculations for acoustic measurements, the only difference being that *LEQ* values are replaced with *RMS* values.

Consequently, the *RMS* statistics as well as the *RMS* spectrum statistics can also be calculated analogously to how it is described in the *Statistics* section of Chapter 8.1.2.: *General noise assessment*.

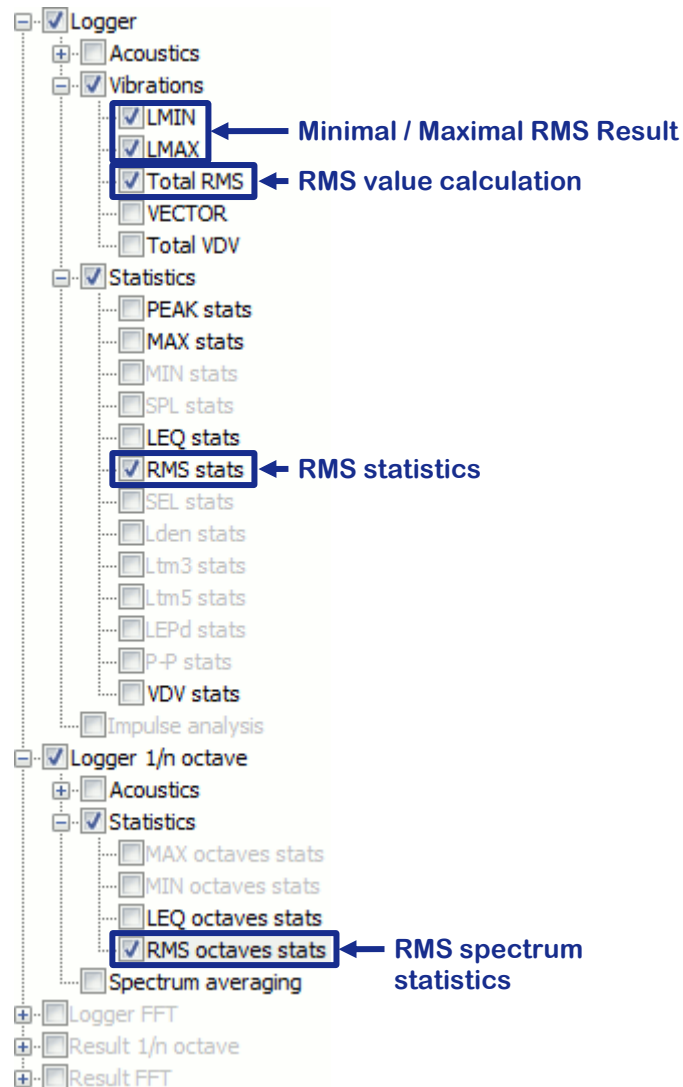


Fig.8.9. Vibration RMS signal based functions on the *Calculator* functions list.

VECTOR function

The *VECTOR* function, available in the *Logger » Vibrations* group, is calculated with the use of *Total RMS* data measured in different channels, according to the formula:

$$VECTOR_k = 10 \cdot \log \left(\sqrt{\sum_n K_n TotalRMS_{k,n}^2} \right) \quad (8.12)$$

n – channel number,

k – sample index in given set of data.

K_n – vector coefficients, which can be adjusted in the *Parameters* panel.

In case of this function, the selection of measurement channels used for calculations is only available in the *Parameters* panel.

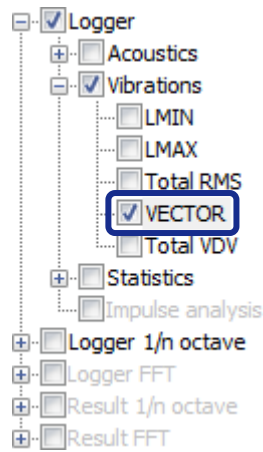


Fig.8.10. VECTOR function on the *Calculator* functions list.

Total VDV – Total Vibration Dose Value

The *Total VDV* function is calculated with the use of *VDV* results, according to the formula:

$$\text{TotalVDV}_k = 5 \cdot \log \left(\sum_1^k 10^{\frac{\text{VDV}_k}{5}} \right) \quad (8.13)$$

k – sample index in given set of data.

It is available in the *Logger* » *Vibrations* group.

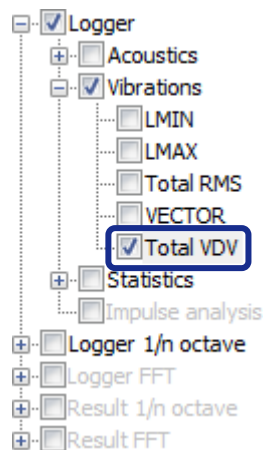


Fig.8.11. Total VDV function on the *Calculator* functions list.

8.2 OTHER FEATURES

8.2.1 DATA MANAGEMENT WITH THE USE OF PROJECTS

Except of the recalculation tools described in Chapter 8.1.: *Environmental Calculator*, the activation of the *Environmental Monitoring Module* also unlocks the *SvanPC++ Projects* tool. It enables to:

- Group multiple files of various types in a *project* file,
- Organize source data,
- Compare data and perform analysis,
- Save your work for later continuation,
- Quickly create reports.

Svan Projects are described in Chapter 10.: *Working with SvanPC++ Projects*.

8.2.2 USING MARKERS WITH ENVIRONMENTAL NOISE DATA

Markers can be defined on selected ranges of the measurement data as a tool for classification. Details on using the *markers* can be found in Chapter 5.1.3.: *Markers*.

In case of the *Environmental Monitoring Module*, the *markers* in conjunction with the advanced *Calculator* tool can serve to simplify the work with noise events.

To post-process a period separately or to process data excluding an unwanted fragment:

1. Go to *Plot view*.
2. Create a marker containing the desired event and name it, e.g. *Event1*.
3. Activate the *Environmental Monitoring Calculator*.
4. Go to the *Calculation period(s)* panel of the *Calculator* dialog box.
5. For processing only in the marked range, in the periods list find the created marker, and select it to perform calculations only in its range.
6. For removing the marked event from the range of calculations, in the periods list find the inverted marker's range, e.g. *Event1 (inverted)*. Select it to perform calculations only outside of the marker's range.
7. Calculate the desired functions using the selected period.

This procedure is illustrated in Fig.8.12.

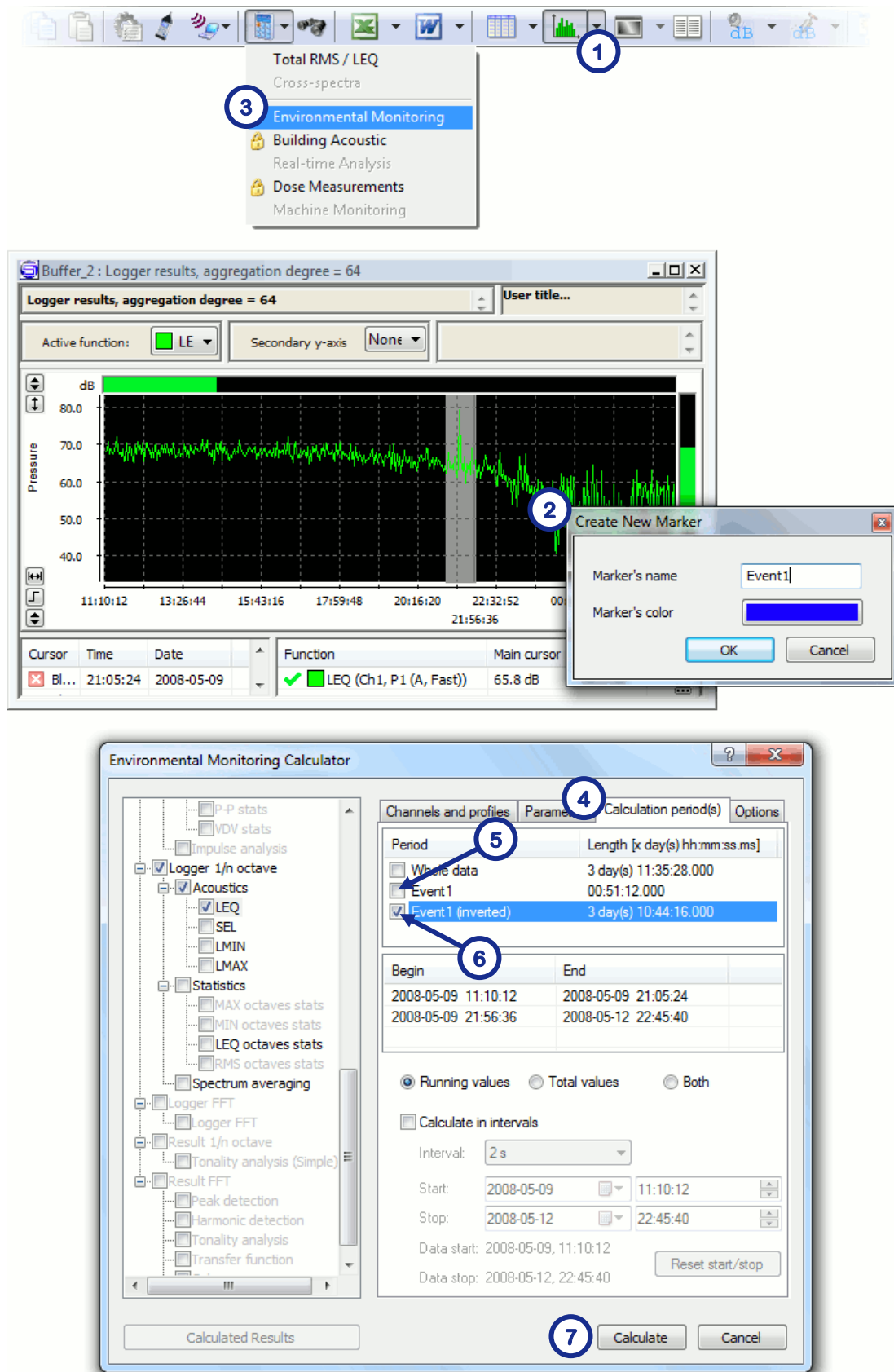


Fig.8.12. Using *markers* with environmental data.

9 SVAN PC++ CALCULATOR TOOL

The *Environmental Monitoring*, *Dose Measurements* and *Building Acoustics* modules provide more advanced tools for data analysis and recalculations in relation to the basic *Calculator* tool, described in Chapter 5.2.: *Total RMS / LEQ and Cross-spectra Recalculations*. It is realised by unlocking additional features of the *Calculator*, disabled in the free version of SvanPC++. This chapter is to discuss these further possibilities of the *Calculator* tool and methods of using them.

After the *EM*, *DM* or *BA Module* has been activated, the corresponding command in the *Calculator* pulldown menu is enabled. To use the recalculation tools specific for the purchased module, open the *Calculator* pulldown menu by using the *Tools » Calculator* command or by clicking on the  icon on the Main toolbar and choose a sub-module from the menu.

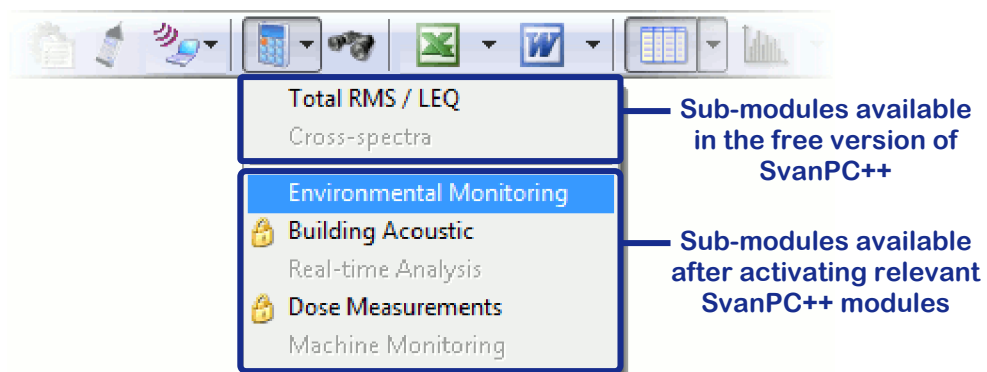


Fig.9.1. Accessing the module-specific *Calculator* tool.

The  icon displayed next to a module's name means that the module is not activated and the functions related to it are unavailable.

Note: For details on viewing the results of calculations, see Chapter 5.2.4.: *Viewing Calculated Results*.

9.1 USING THE CALCULATOR DIALOG BOX

After selecting a Calculator sub-module, the *Calculator* dialog box will appear.

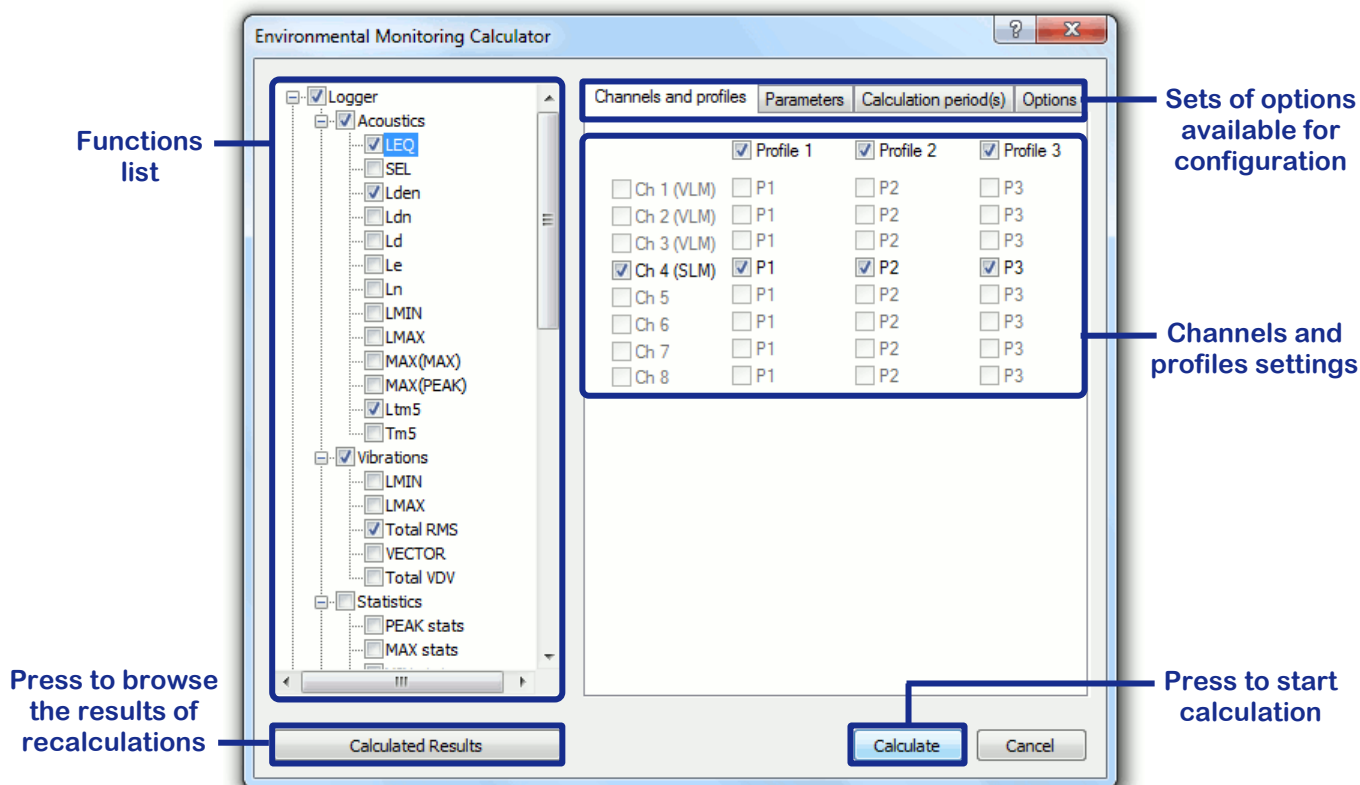


Fig.9.2. The *Calculator* dialog box.

All the functions available for recalculation are displayed on the list located at the left side of the window. By clicking on the check-boxes next to the names of the functions you can select / deselect the functions you wish to calculate. You can select multiple functions for simultaneous calculation. The functions are displayed in *tree* mode, grouped by categories. By selecting a branch containing multiple functions, you can select all the functions belonging to the relevant category.

For each function various settings are available. Some settings are common to all functions, but all of them can be configured separately for each function. The right side of the *Calculator* dialog box enables the configuration of settings for a particular function after selecting it from the list, or simply after clicking on its name if it is already selected.

Configuration of the Calculator settings is divided into 4 sets of options:

- *Channels and profiles*,
- *Parameters*,
- *Calculation period(s)*,
- *Options*.

You can select a set of options by clicking on a tab in the upper-right part of the window.

9.1.1 CHANNELS AND PROFILES

The *Channels and profiles* settings enable to choose the data set which will serve for recalculations. All the available measurement channels and profiles from the currently opened data are listed in this panel. The elements marked in grey represent data for which the selected calculation is unavailable. To select data, click on the corresponding check-boxes. Clicking on a check-box next to the name of a channel will select all profiles available for the selected channel. Analogously, clicking on a check-box next to the name of a profile will select all channels available for the selected profile.

Note: In case of some functions, calculated on specific data, this mode of data selection is disabled. For example, in case of *Cross-spectra* calculations, you can only choose the cross-spectrum data in the *Parameters* settings.

9.1.2 PARAMETERS

The *Parameters* panel enables to configure the function-specific parameters of calculations. The set of parameters available to configure depends on the currently selected function. For details on the functions available in a particular SvanPC++ module, see the chapter related to that module.

The screenshot shows the 'Parameters' tab of a dialog box. At the top, there are four tabs: 'Channels and profiles', 'Parameters' (which is selected), 'Calculation period(s)', and 'Options'. The 'Parameters' tab contains several settings:

- 'Day-time starts at [hh:mm:ss]:' with a value of 06:00:00 and a spin button.
- 'Evening-time starts at [hh:mm:ss]:' with a value of 18:00:00 and a spin button.
- 'Night-time starts at [hh:mm:ss]:' with a value of 22:00:00 and a spin button.
- 'Evening penalty factor [dB]:' with a value of 5.00 in a text box.
- 'Night penalty factor [dB]:' with a value of 10.00 in a text box.
- A checked checkbox labeled 'Calculate using reference time'.
- 'Reference time (day) [hh:mm:ss]:' with a value of 08:00:00 and a spin button.
- 'Reference time (evening) [hh:mm:ss]:' with a value of 08:00:00 and a spin button.
- 'Reference time (night) [hh:mm:ss]:' with a value of 08:00:00 and a spin button.
- 'Reference level [dB]:' with a value of -40.00 in a text box.
- A 'Reset to defaults' button at the bottom right.

Fig.9.3. *Parameters* panel of the *Calculator* dialog box for the *Lden* function.

9.1.3 OPTIONS

In the *Options* panel you can enable or disable two options: *Close window after calculations* and *Cumulate results* by clicking on the check-boxes next to their names.

Enabling the *Close window after calculations* option will automatically close the calculator dialog box when you press the *Calculate* button.

The *Cumulate results* option concerns the calculations performed on non-continuous blocks of data.

- If this option is disabled, the selected function(s) will be calculated for each separate block of data independently, starting the recalculation from the beginning at the start points of every data block.
- If this option is enabled, the function(s) will be calculated as if all the separate selected blocks of data formed one continuous selection, without starting the recalculation from the beginning.

Note: For some functions this option is not available. It is also not possible to perform calculation on intervals with the *Cumulate results* option. To make the *Cumulate results* option available, uncheck the *Calculate in intervals* check-box in the *Calculation period(s)* tab.

9.2 SPECIFYING THE CALCULATION PERIODS

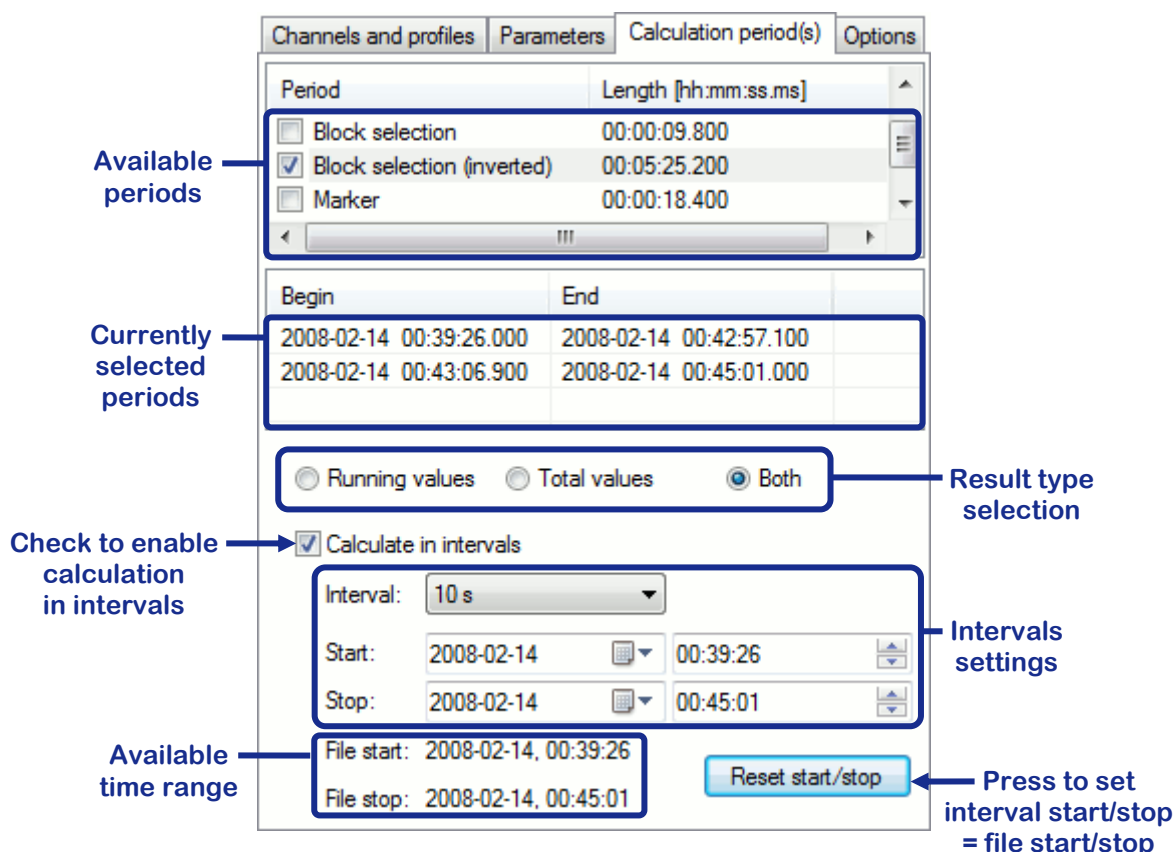


Fig.9.4. *Calculation period(s)* panel of the *Calculator* dialog box.

The *Calculation period(s)* settings enable to select the range of the time domain for which the calculations should be executed.

Periods

The *Period* panel enables to choose subset of data used for calculations.

- The *Whole data marker* is always available, enabling to perform calculations on the whole data.
- If a *Block selection* has been made in the current view, you can choose to perform calculations only on the selected data. You can also choose the inverted selection, meaning that calculations will be performed on all the data *outside* of the current block selection.
- If there are *Markers* defined on the data, you can perform calculations in the time periods specified by the markers or outside of them.

You can select multiple periods. The selected function(s) will be calculated for each period separately.

The table below the *Period* panel shows the begin and end points of all separate blocks contained in the selected ranges of the time domain.

Note: You can use the *Inverted block selection* to remove a selected fragment of data from the calculations. It is also possible to use the *Period* data selection mode with *calculation on intervals* mode simultaneously.

Running / Total values

The buttons in the middle of the window enable to choose whether *Running* values, *Total* values or both should be calculated.

- *Running values* – this option should be used if changes of the calculated function values during each interval / period are considered.
- *Total values* – this option should be used when only the final results of the calculations are considered.

Note: In case of *Total values* recalculated functions, a specific *View sub-window* type is available, where function values are displayed once for each calculation period together with information about the period. It is described in Chapter 4.3.2.: *View Sub-windows Types*.

Intervals

You can also choose to perform the calculations in intervals. To do so, click on the check-box signed *Calculate in intervals*. You can then choose the start and stop time of the intervals and the interval period.

The range of the time domain available in the currently opened file is displayed at the bottom of the window. Pressing the *Reset start/stop* button will set the *interval start / stop* time equal the *file start / stop* time.

If you choose to perform calculation on intervals, the *common part* of the adjusted intervals and the selected periods will be used for calculation.

Note: If the selected interval start time does not correspond to the logger step, it will be adjusted automatically.

After reopening the *Calculator* dialog box, the last settings of the interval start / stop time and period will be reloaded, if possible. If the last used settings do not fit the available range of data, they will be automatically set within the limits of the available data.

It is not possible to perform calculation on intervals with the *Cumulate results* option. To make the *Cumulate results* option available in the *Options* panel, disable the *Calculate in intervals* option using the corresponding check-box.

Periodic functions

In case of some functions, settings related to the calculation period are also available in the *Parameters* panel, e.g. *Lden*, *Ldn*, *Ld*, *Le*, *Ln* functions. The time period used for calculations is then equal the common part of the *Parameters* and *Calculation period(s)* settings.

Time display mode

You can decide whether to work with absolute or relative time values. To do so, open the *Main Options* dialog box using the *Tools » Main options* command or clicking on the  icon on the Main toolbar. Then go to the *General* settings and use the buttons of the *Time* panel.

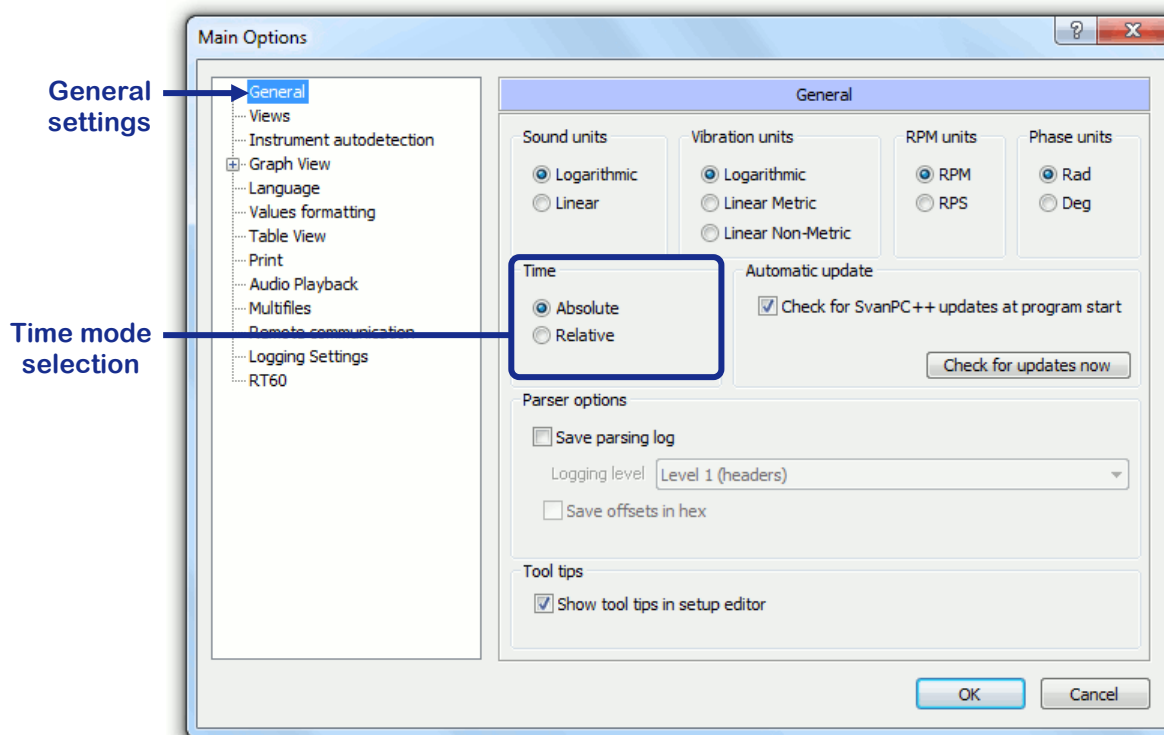


Fig.9.5. Time settings in the *Main Options* dialog box.

10 WORKING WITH SVAN PC++ PROJECTS

The *SvanPC++ Projects* feature is a useful tool, which enables to manage multiple files of various types, modify and save data views, as well as create reports, using the measurement data contained in project.

This feature is not included with the free *Viewer* version of the SvanPC++ software. It is available after activating the *Environmental Monitoring*, *Building Acoustics* or *Dose Measurements* module.

A *Svan Project* is a structure in the form of a *.svp* file, containing files downloaded from Svan instruments and other types of files.



10.1 CREATING PROJECTS

To create a new project, use the *New project* command from the *File* menu. The created project will be empty.

You can also create a new project from the files currently opened in SvanPC++. This also allows to save any actions that have been done in the *Viewer* module. To do so, use the *Convert to project* command from the *File* menu.

When you begin to work with a Svan Project, all other files will be closed.

10.2 USING THE PROJECT BROWSER

When a Svan Project is opened, the *Project Browser* will automatically be displayed. It can also be manually shown / hidden with the use of the *Project Browser* command from the *View* menu.

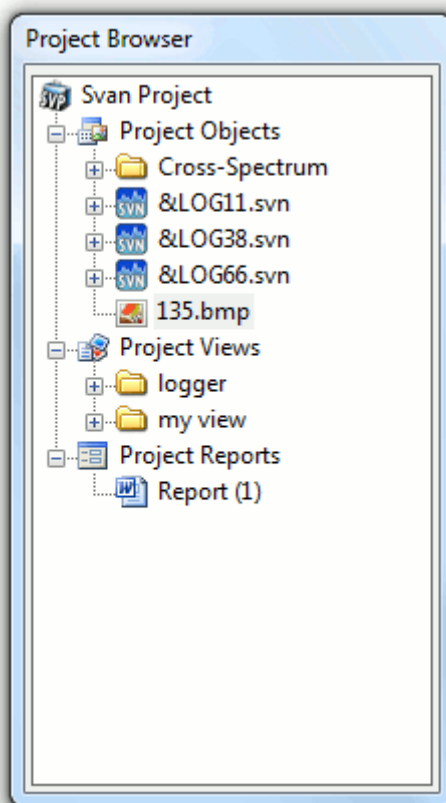


Fig.10.1. *Project Browser* sub-window.

Moving the Project Browser

You can change the location of the *Project Browser* in two ways:

- clicking with the left mouse button somewhere on the border of the *Project Browser* and moving the mouse without releasing the button, or
- using the *Dock left / Dock right* commands in the pulldown menu opened by clicking anywhere in the *Project Browser* area with the right mouse button.

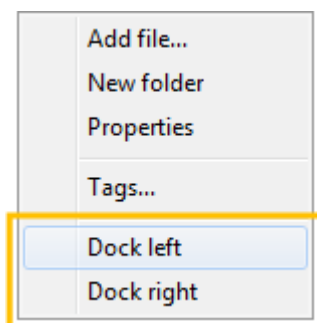


Fig.10.2. Commands serving to dock the *Project Browser*.

Files organization

A list of files, contained in the current project, is displayed in the *Project Browser*. It is divided into 3 parts:

- *Project Objects* – files containing measurement results data and other related information, used in the project. This can also be calculation results, view, photos, graphics, pictures, report templates etc.
- *Project Views* – views of the data, such as the ones described in Chapter 4.3.2.: *View sub-windows types*, which you can modify and save.
- *Project Reports* – MS Word text files, containing measurement data, results etc.

10.2.1 PROJECT OBJECTS

Adding data

You can add data files to the project in two ways:

- simply clicking with the left mouse button on the desired file in the explorer and dragging it without releasing to the Project Objects list, or
- using the *Add file* command, available after clicking with the right mouse button on *Project Objects* or a folder contained within this list. This command will activate the *Open File* dialog box where you can choose the file you want to add.

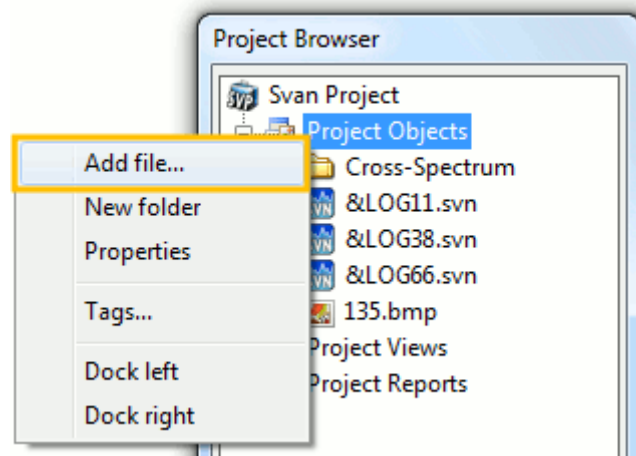


Fig.10.3. Adding files to the *Project Objects*.

Organizing data

You can manage the files in the Project Objects list in sub-catalogues.

- To create a new folder, click on *Project Objects* or on the name of an already existing folder with the right mouse button and choose *New folder* from the menu. The new folder will be created inside the selected location.
- To place a file in a folder, click on it with the left mouse button and move it without releasing to the desired location.
- To rename a file, click on its name with the right mouse button and choose the *Rename* option. You can also use the *F2* button or click twice slowly on the file name.
- To delete a file from the project, click on its name with the right mouse button and choose the *Delete* option. You will be asked for confirmation.

Note: Any changes you make on the files contained in the project, such as renaming, will not affect the original files. When you delete a file from the current Svan Project, the original file is not deleted.

Note: When you attempt to delete an object, related to views contained in the current Project Views, you will be asked for additional confirmation. You can also choose whether SvanPC++ should automatically remove the view folders which remain empty after the deletion of the object or not. To set this option, check the *Remove empty views* control.

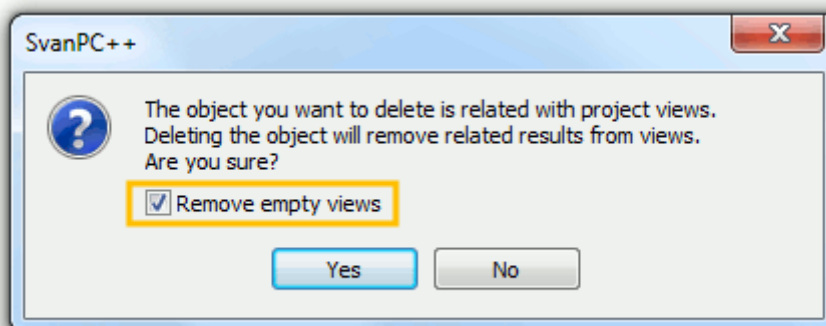


Fig.10.4. Removing empty views from the *Project Objects*.

Creating views from the data

To start working with a results file and open a *View sub-window*, you can do one of the following:

- Clicking on the file name with the right mouse button opens a menu, containing all the views available for the selected file. Choosing a view from the list will open a view window of the selected type.
- Clicking on the file name with the right mouse button and choosing the *Create default view* option will open a view of the type specified in *Main Options* » *Views* settings. If no view contained in the *Opening priority* list is available for the selected file, the *Header Info* will be opened.
- Clicking twice with the left mouse button on the name of a results file has the same effect as the *Create default view* option.

When you create a view using the *Project Objects*, the relevant view window is automatically opened in the *Working Area*. A corresponding folder is created in the *Project Views* list.

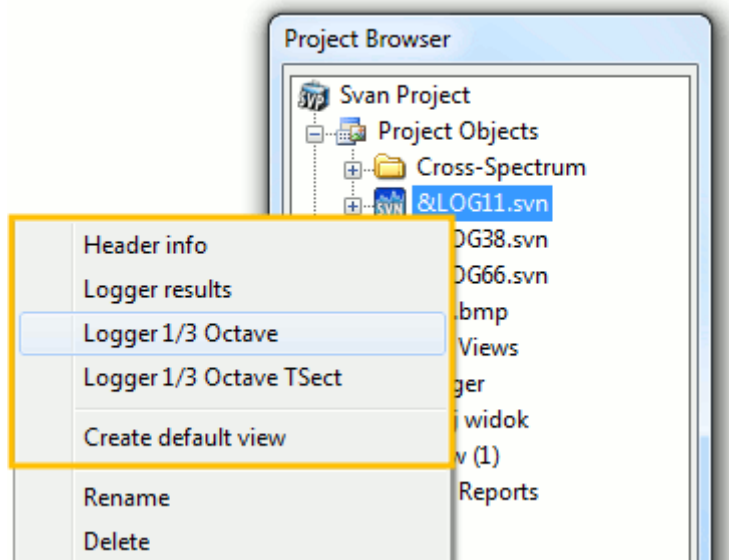


Fig.10.5. Opening views with the *Project Objects* list.

10.2.2 PROJECT VIEWS

The *Project Views* list is filled with catalogues containing data about the SvanPC++ views, created in the current *Svan Project* with the use of the *Project Objects*.

The new feature of the *Svan Projects* feature, unavailable in the free version of SvanPC++, is that modifications made while working with views can be saved and then reloaded when you open the project.

Creating views

New views are created using the measurement results data through the *Project Objects* list, as described in the *Creating views from the data* section of Chapter 10.2.1.: *Project Objects*.

When there is at least one view in the *Project Views* list, you can create a copy of it. To do so, click on the view name with the right mouse button and choose the *Duplicate view* option. A new view folder, identical with the duplicated one is then put on the list.

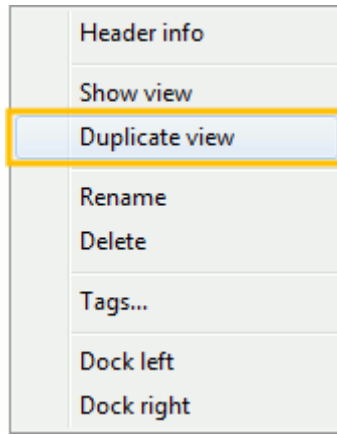


Fig.10.6. Duplicating a *Project view*.

Views organization

The Views are grouped in folders of specified names. These folders contain all the types of views available for contents of a sub-catalogue called *Data*.

When views are created, they are named automatically as "*View (#)*", where # is the lowest unoccupied number. You can change the name of the view folder in 3 ways:

- Clicking on the folder name with the right mouse button and choosing the *Rename* option,
- Clicking on the folder name with the left mouse button twice slowly,
- Pressing *F2* with the folder name selected on the Project Browser list.

Note: The view folders names cannot contain any of the following characters: / \ : * ? " < > |

You can delete a view folder, clicking on its name with the right mouse button and choosing the *Delete* option. You can also press the *Delete* button with the folder name selected on the Project Browser list.

- All the data contained within this folder will be then deleted. However, the corresponding measurement results file (contained in the Project Objects list) will remain unchanged.
- You can also delete multiple views at once. To do so, select all the folders you wish to delete (clicking on their names with **CTRL** or **Shift** pressed) and press the **Delete** button.

Opening the views

To open a view window in the working area, you can do one of the following:

- Clicking on a view folder in the *Project Browser* with the right mouse button will open a pulldown menu with the names of all the view types available for the data contained in the selected view. Choosing a view type from the menu will open the view window of the relevant type.
- Choosing the *Show view* option in the same pulldown menu will show a view of the type specified in *Main Options* » *Views* settings. If no view contained

in the *Opening priority* list is available for the selected file, the *Header Info* will be shown.

- Clicking twice on the view folder in the *Project Browser* with the left mouse button has the same effect as the *Show view* option.
- All the available views are also listed inside the view folder. To show a selected view, click on its name twice with the left mouse button or choose the *Show view* option, available after clicking on the view name with the right mouse button.

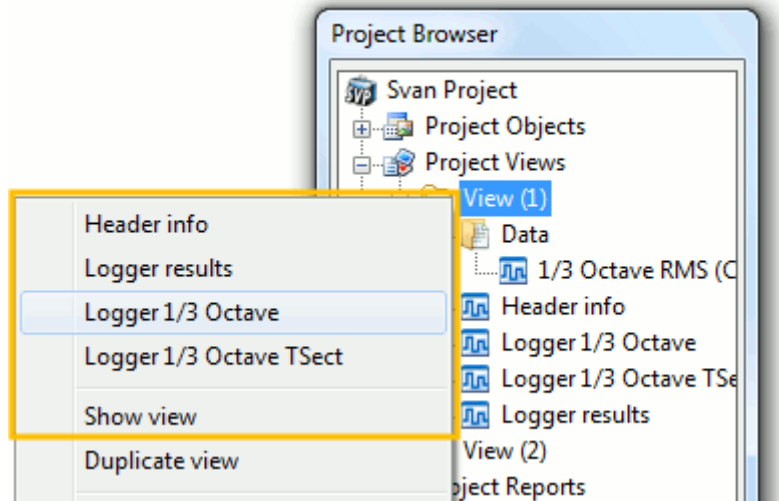


Fig.10.7. Opening views in the *Project Views* list.

When a view is opened in the working area, you can work with it in the same mode as using the free *Viewer* module. However, all the modifications can be saved.

10.2.3 PROJECT REPORTS

A *report* is a file in the MS Word format, created with the use of objects and views contained in the project.

Note: Microsoft Word 2003 or newer must be installed on your PC to work with reports.

Creating reports

To create a new report, click on *Project Reports* in the *Project Browser* with the right mouse button and choose the *New report* option.

MS Word will be opened and a new, empty document will be automatically created. A new object will also appear on the *Project Reports* list, called "*Report (#)*", where # is the lowest available number. This name cannot be changed.

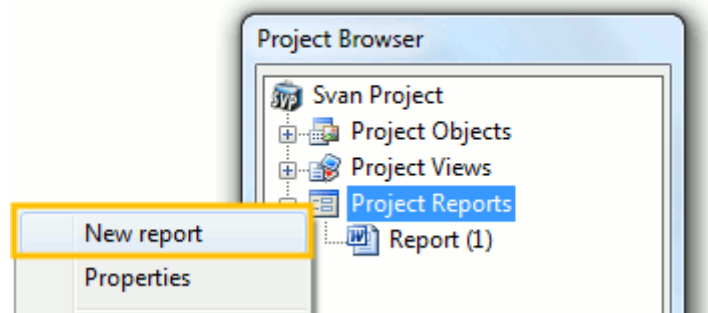


Fig.10.8. Creating a new *report*.

The report is only viewed in MS Word. If you close the report document, you can reopen it by clicking on the report name with the right mouse button and choosing the *Show report* option.

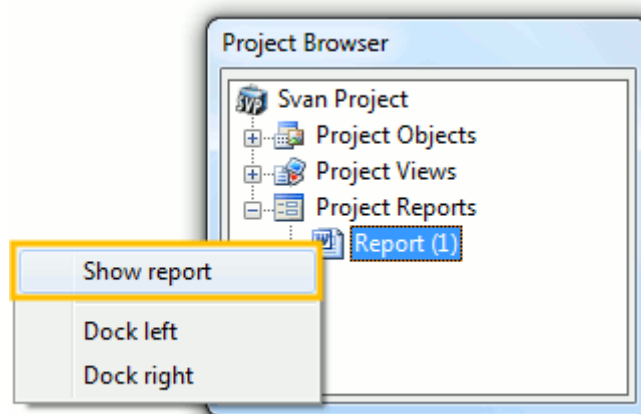


Fig.10.9. Reopening a *report*.

To delete a report, select it in the Project Reports list and press the *Delete* button. You will be asked for confirmation.

Adding data

You can add files of various types to the report document, clicking on the files in the Project Browser area and dragging them on the report file position on the Project Reports list.

Adding objects such as *pictures*, *text* etc. will simply paste them into the document.

Adding plots from the Project Views list can be performed in two modes, selected via Reports Toolbar:

- as bitmaps - in this mode the view is represented in a stable picture form, but cannot be modified;
- as metafiles - in this mode modifications of the view are possible in MS Word, but the representation of the view may not be stable.

The objects added to the report are pasted at the current location of the cursor in the report document.

The easiest way to add views or graphic files to the report is to simply drag them from the *Project Browser* directly to the MS Word document, as shown in Fig.10.10a.

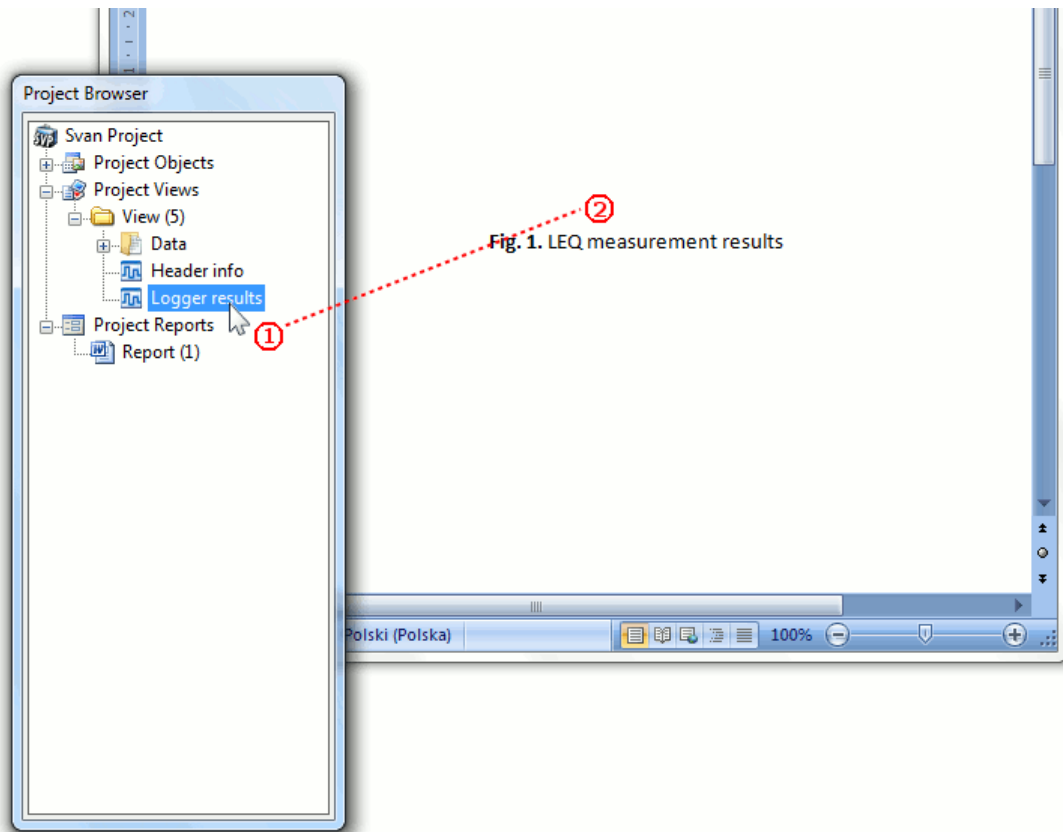


Fig.10.10a. Dragging objects from the *Project Browser* to an MS Word document.

10.3 REPORTS TOOLBAR

The *Reports Toolbar* contains useful tools, specific for building reports. You can show / hide the Reports Toolbar using the *Reports Toolbar* command from the *View* menu. The controls, available in the Reports Toolbar, are listed in Table 10.1.

Table.10.1. *Reports Toolbar* buttons.

<i>Icon</i>	<i>Name</i>
	– <i>Switch dragging mode</i>
	– <i>Include table header</i>
	– <i>Drag table selection</i>
	– <i>Include fonts and colors</i>
	– <i>Drag plot as bitmap</i>
	– <i>Drag plot as metafile</i>
	– <i>Tile app and report horizontally</i>

The *Dragging mode* tool

This tool enables to easily add data to your report. To switch the dragging mode on / off, use the  button.

When the dragging mode is enabled, the mouse cursor face will turn to .

In the dragging mode, you can do the following to add data to the report:

1. Click on an object which you want to add to your report (it can be an object on the *Project Browser* list, as well as a *View Sub-window* in the working area) with the left mouse button, without releasing it,
2. Move the mouse to the report name on the *Project Browser* list, or to the desired place in the MS Word report document window,
3. Release the mouse button.

If you drag an object to the report name on the *Project Browser* list, it will be included in the report at the current location of the cursor in the MS Word report document.

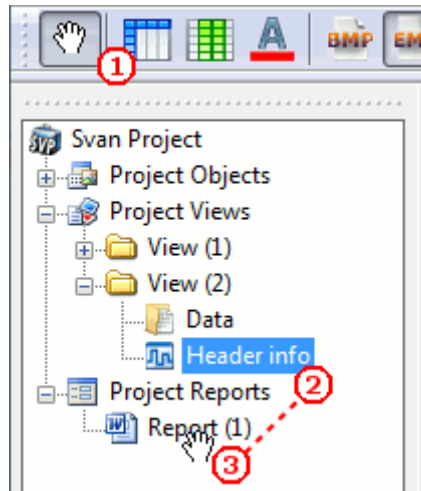


Fig.10.11. Using the *Dragging mode* tool.

***Include table headers* button**

The  button can be used to configure the parts of the table view that are copied to the report.

If the *Include table header* button is pressed, when you add a *Table view* to a report, it will be copied together with the columns and rows with information about the table contents.

If it is not pressed, only the cells with numerical data will be copied.

		Ch1 (SLM)	Ch1 (SLM)
		1/3 Octave RMS ...	1/3 Octave RMS ...
No	Date & time	20.0 Hz	25.0 Hz
1	2007-08-08 09:31:06.100	0.001	0.004
2	2007-08-08 09:31:06.200	0.0010	0.004
3	2007-08-08 09:31:06.300	0.001	0.002
4	2007-08-08 09:31:06.400	0.001	0.002
5	2007-08-08 09:31:06.500	0.0008	0.002
6	2007-08-08 09:31:06.600	0.001	0.002
7	2007-08-08 09:31:06.700	0.002	0.002
8	2007-08-08 09:31:06.800	0.0008	0.001
9	2007-08-08 09:31:06.900	0.002	0.0008
10	2007-08-08 09:31:07.000	0.0005	0.002

Fig.10.12. Parts of the *Table view*, which are copied only if the *Include table header* button is pressed (marked in red).

Table dragging modes

The mode of adding *Table views* to the report can be switched using the  button. There are two modes available:

- *Drag table selection* mode - in this mode only the selected cells are copied to the report. If there is no current selection in the table view, the whole table will be copied. This mode is active if the *Drag table selection* button is pressed.
- *Drag whole data* mode: In this mode the whole table is copied to the report, even if there are cells currently selected in the table view. This mode is active if the *Drag table selection* button is not pressed.

Include fonts and colors button

The  can be used to configure the settings of copying *Table views* to the reports.

If the *Include fonts and colors* button is pressed, *Table views* will be copied to the reports keeping the current table font style and color settings.

Otherwise, tables added to the report will include the font and color currently active in MS Word.

Plot dragging modes

The  /  can be used to set the mode of copying views to the report.

There are two modes available:

- *Drag plot as bitmap (BMP)*,
- *Drag plot as metafile (EMF)*.

In the *BMP* mode, the views are represented in a stable picture form, but cannot be modified. In the *EMF* mode, modifications of the view are possible in MS Word, but the representation of the view may not be stable.

Tile horizontally button

The  button can be used to set the screen configuration easier to work with SvanPC++ and a report simultaneously. After pressing this button, the SvanPC++ application window will fill the left half of the screen, while the MS Word report document window will fill the right half of the screen.

10.4 REPORT TEMPLATES

The *Report templating* is a special feature useful for creating reports. The *Report templates* have the same form as a report, however, they may contain templated objects. When you generate a report, based on a report template, all the templated objects are replaced with views, parameters or results, taken from objects, contained in the current Svan project.

10.4.1 CREATING TEMPLATES

The report templates, contained in the current Svan project, are listed in the *Project Browser* » *Project Reports* list.

To create a new report template, click with the right mouse button on the *Project Reports* list name (or a sub-catalogue) and select the *New report template* command.

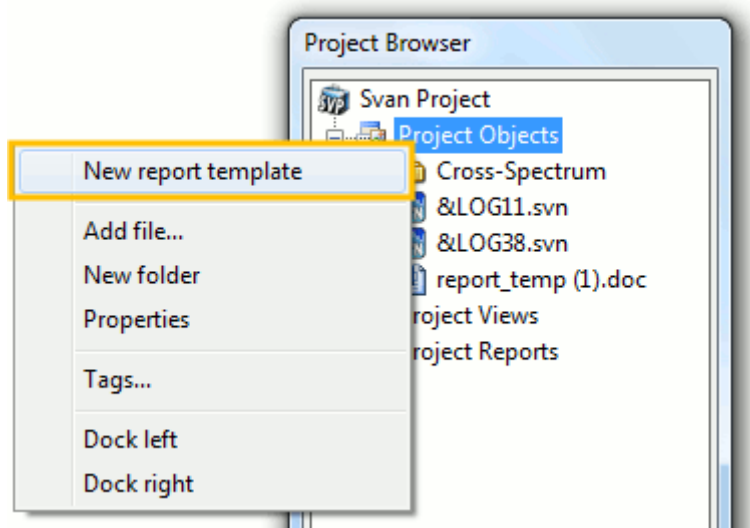


Fig.10.13. Creating a new *report template*.

The report templates are created as MS Word documents (same as reports), of names "*report_temp (#)*". When you create a report template, the corresponding MS Word document is automatically opened.

10.4.2 EDITING TEMPLATES

The constant parts of the report templates are edited directly in MS Word.

- The MS Word document, corresponding to the report template, is automatically opened when you create a new template.
- To manually open the corresponding document, click with the right mouse button on the name of the template you wish to open and select the "*Open*" command.

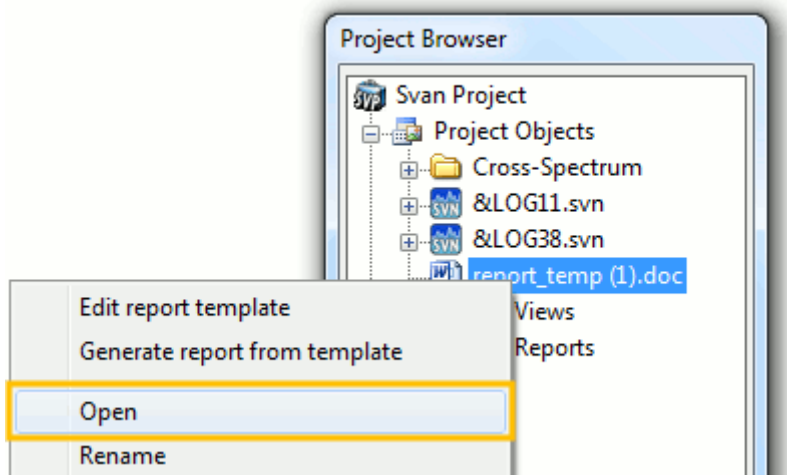


Fig.10.14. Opening a *report template* in MS Word.

To edit the templated objects, you can use the *Report Template Editor* dialog box.

- This dialog box is opened automatically when you create a new template.
- To manually open the *Report Template Editor*, click with the right mouse button on the name of the template you wish to edit and select the "*Edit report template*" command.

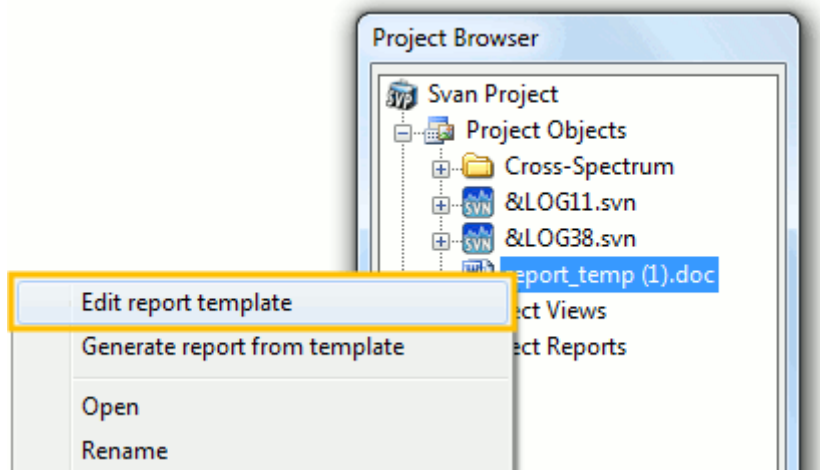


Fig.10.15. Opening the *Report Template Editor*.

Note: The templated objects are added to the MS Word document in the form of *commentaries*, assigned to the text "*SvanPC++*". However, the content of the commentaries has the form of a code, understandable by the SvanPC++ application. It is advisable to edit templated objects with the use of the *Report Template Editor* and do not modify the corresponding fragments of the MS Word report template document.

Report Template Editor

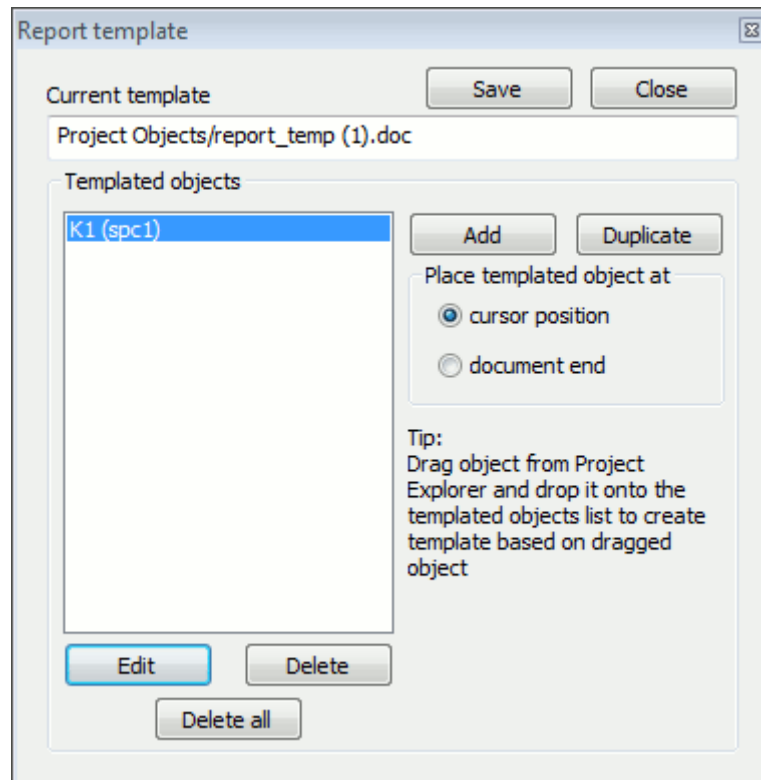


Fig.10.16. Report Template Editor dialog box.

The currently edited template's name is displayed in the *"Current template"* field, at the top of the window.

The templated objects, contained in the current report template, are listed in the *Templated objects* list, located at the left side of the window. To add a new templated object, you can do one of the following:

- Press the *Add* button.
- Select a templated object on the list and press the *Duplicate* button. A copy of the selected object will be created.
- Select an object from the *Project Browser* list and drag it to the *Templated objects* list.

The new objects can be added:

- at the current location of the cursor in MS Word or
- at the end of the report template document

To decide, use the buttons in the panel signed *Place templated object at*, located at the right side of the window.

Note: If a MS Word warning window appears, saying that commentaries must be added to the main text, it means that the cursor in MS Word is currently located in a commentary text, where it is impossible to add templated objects. To add a templated object, you must move the cursor in MS Word outside of the commentaries.

To edit the templated objects, use the *Templated object parameters* dialog box. This dialog box is opened automatically when you add a new templated object or drag an object from the *Project Browser* and drop it to the Templated objects list. You can also activate it manually by selecting a templated object from the list and pressing the *Edit* button.

10.4.3 GENERATING REPORTS FROM TEMPLATES

The main purpose of using report templates is to easily create reports, containing constant text parts together with templated objects, depending on the results files and other project objects.

To generate a report based on a report template, click with the right mouse button on the name of the template and select the *Generate report from template* command.

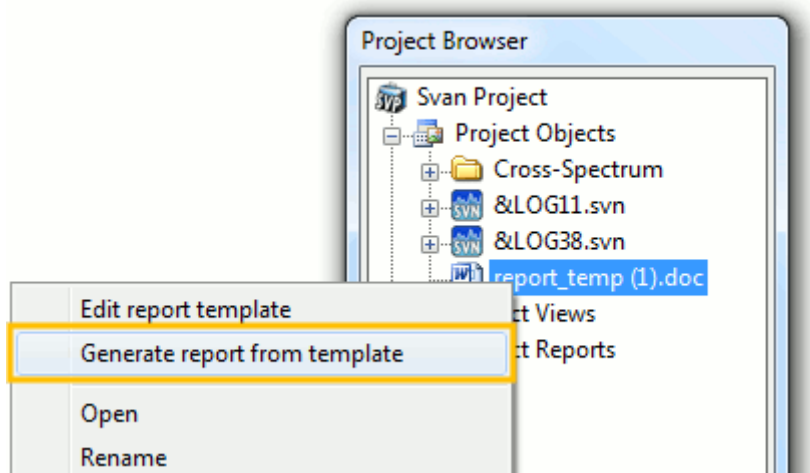


Fig.10.17. Generating reports from templates.

When you activate the *Generate report from template* command, a new report will be created on the *Project Reports* list. The corresponding MS Word document will be automatically opened. All the templated objects will be replaced with proper text, tables, pictures etc.

In case there are multiple results satisfying the criteria specified for a templated object, the *Report template multi sources* dialog box will appear, allowing you to select the source for replacing the templated object.

All the objects that can be used to replace the templated object are displayed on the list. To select one of them, click on it and press the *OK* button.

If you press the *Skip* button, the templated object will not be replaced (it keeps the form of the "*SvanPC++*" text with a commentary assigned to it).

Pressing the *Skip all* button will skip the current templated object and prevent from activating the *Multi-sources* dialog box in case any later templated objects can also be matched by several objects.

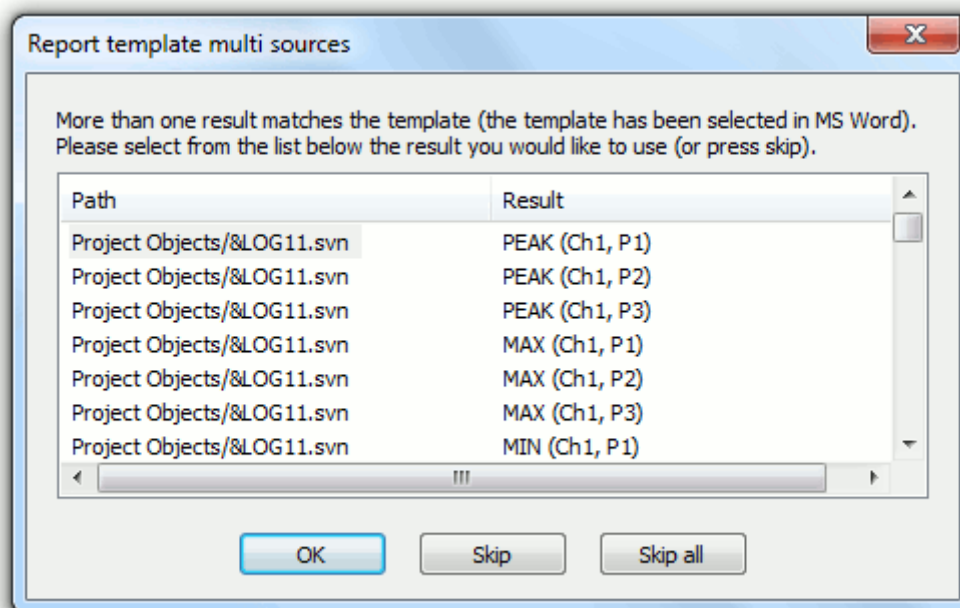


Fig.10.18. Report template multi sources dialog box.

Note: To see which of the templated objects is currently considered, look in the MS Word document containing the used report template. The text, corresponding to the templated object for which multiple sources are found, is automatically selected in MS Word.

10.5 DATA SEARCH TOOL

The *Data Search* tool serves to find files contained in the current project, satisfying specified conditions, such as a certain filename or measurement time.

The files are searched with the use of tags, assigned to them automatically or manually.

10.5.1 TAGS

Tags are conformed by two parts: *category* and *value*. The *category* specifies the type of information given in the tag, while the *value* contains the specified data for the object, to which the tag is assigned.

There are three types of tags, defining the type of provided data:

- *Text*,
- *Number* and
- *Date*.

The tags are divided into two groups:

- *Automatically assigned tags* - these tags are created automatically and contain information about the measurement and the file. This group of tags cannot be modified.
- *User tags* - these tags are assigned to the object manually and can contain any category or value, defined by the user.

Note: Tags are only used by the *Data Search* tool.

Tags can be added to objects from the *Project Objects* list (files, folders, channels) and to *Project Views*. To view or edit tags for a selected object, click with the right mouse button on its name in the *Project Browser* list and in the pulldown menu choose the *Tags* command.

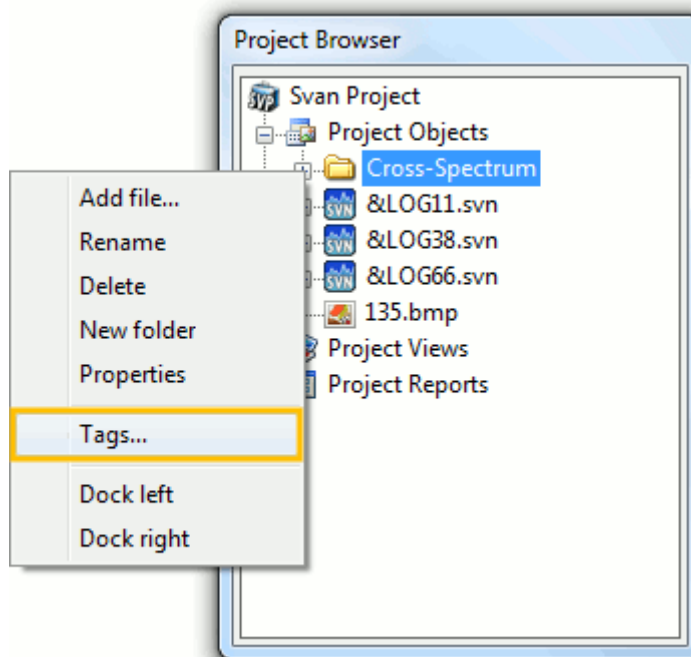


Fig.10.19. Opening the *Tags* dialog box.

After activating the *Tags* command, the *Tags* dialog box will appear.

The *Automatically assigned tags* and *User tags* lists are automatically filled with tags assigned to the object currently selected in the *Project Browser* list.

It is possible to assign a new tag to the selected object, edit a *User tag* already assigned to it or remove an already assigned *User tag*, using the buttons located at the bottom of the window. You can also remove a selected *User tag* from all the sub-items, contained in the selected *Project Object*.

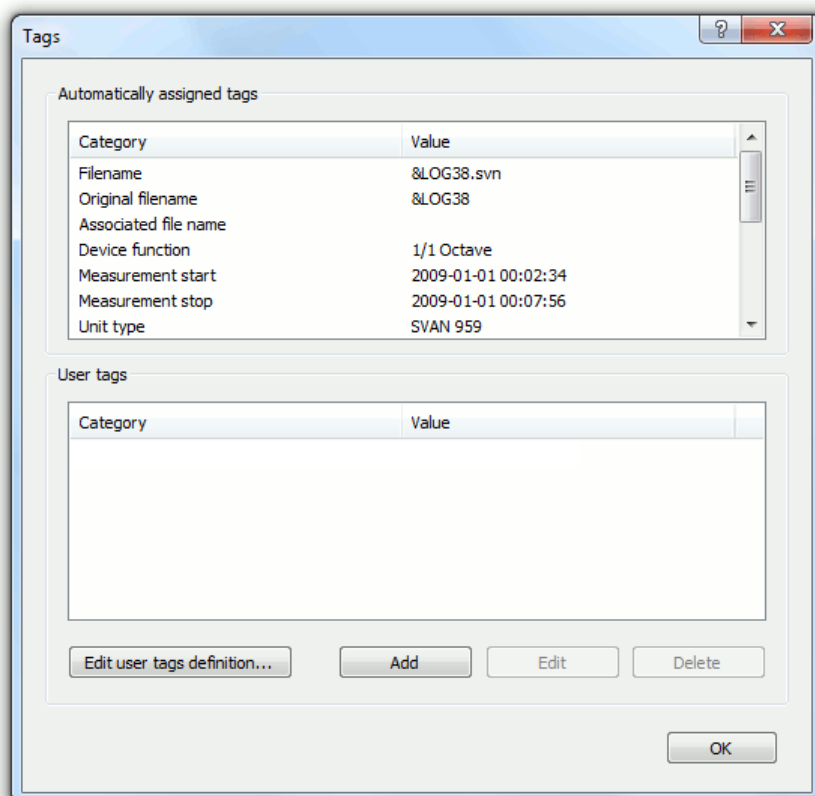


Fig.10.20. *Tags* dialog box.

To create a new *User tag*, use the *User tags definition* dialog box. It can be opened by pressing the *Edit user tags definition* button, located at the lower-left corner of the *Tags* dialog box.

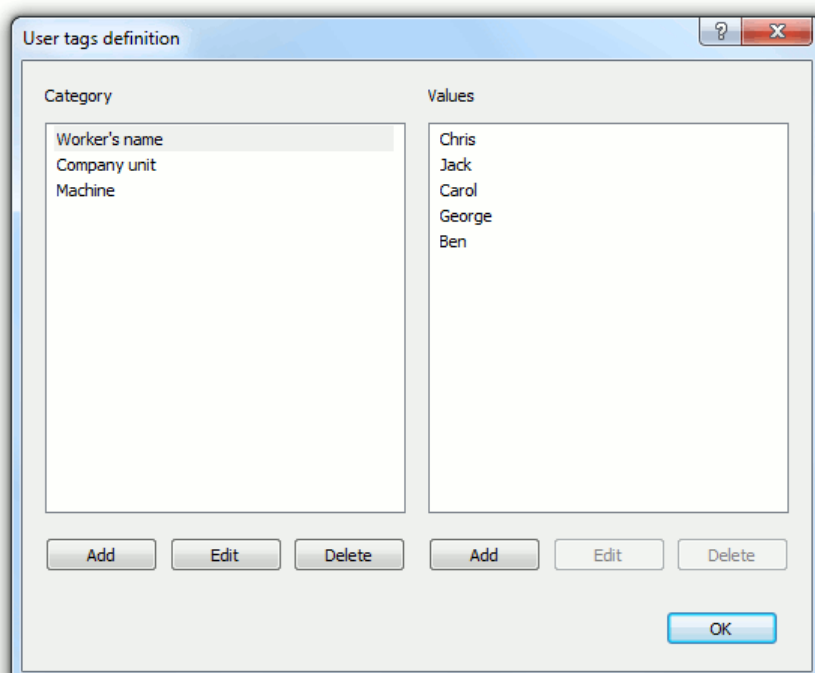


Fig.10.21. *User tags definition* dialog box.

This dialog box can also be opened with the *User tags definition* command from the *Tools* menu.

The list on the left side (*Category*) contains all the tag categories already defined by the user. The list on the right side (*Values*) contains all the values available for the selected category. The *Values* list and the corresponding buttons are only available if a category is selected in the *Categories* list.

You can use the *Add*, *Edit* and *Delete* buttons located below both lists to modify their contents.

10.5.2 PERFORMING DATA SEARCH

To perform the search, use the *Data search* dialog box. It can be opened in two ways:

- using the *Data search* command from the *Tools* menu,
- using the  button from the Main toolbar.

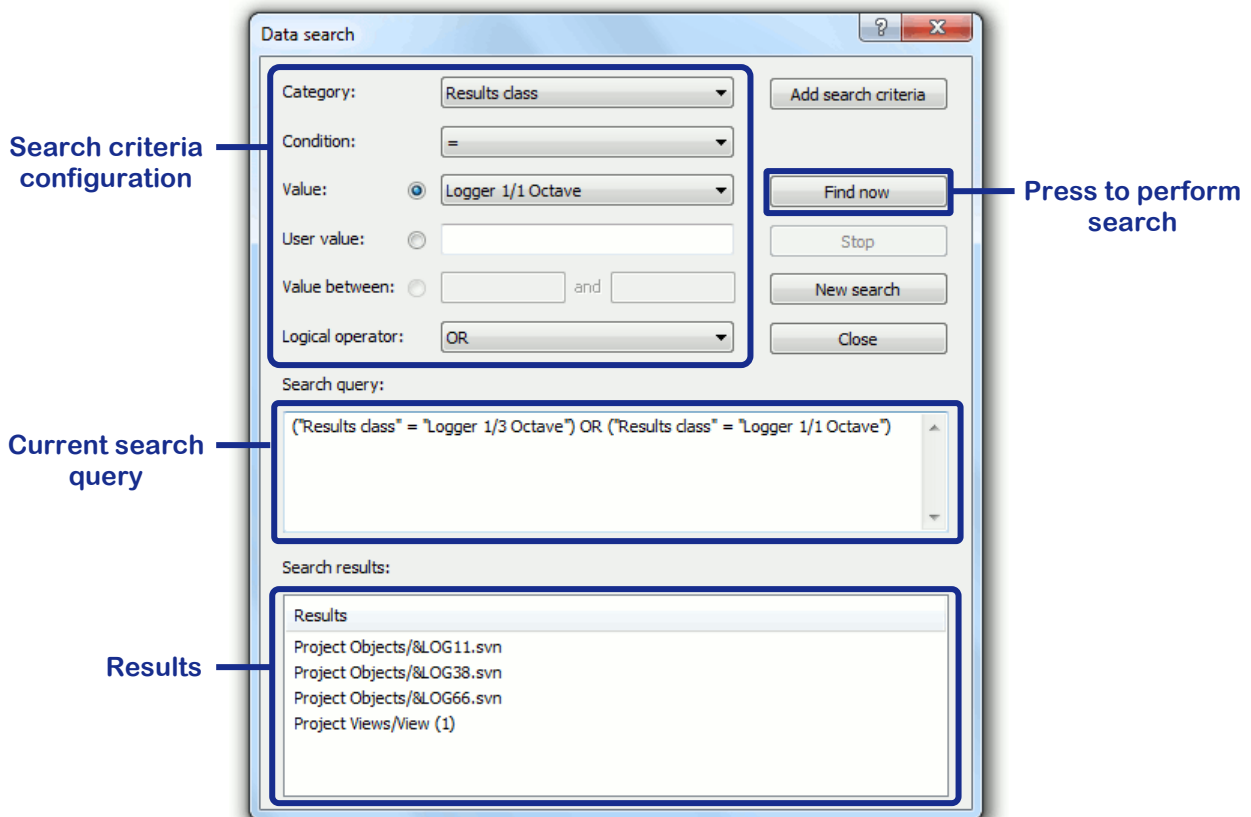


Fig.10.22. *Data search* dialog box.

To use the *Data search* tool, you should do the following:

1. Specify a search query.
2. Perform the search using the *Find now* button.
3. Browse the search results, displayed at the bottom of the window.

Building a search query

A *search query* is conformed by several *search criteria*, each describing one category. An example of a *search criteria* could be:

"Results class" = "Logger 1/3 Octave".

An example of a *search query* could be:

"Results class" = "Logger 1/3 Octave" OR "Results class" = "Logger FFT".

To add a search criteria to current query, the following steps are necessary:

1. *Specify a tag category.* You can choose a category such as *Measurement time start* or *File type* from the list of all the available tag categories, created automatically as well as defined by the user.
2. *Specify the condition type.* You need to select the type of condition that has to be satisfied by the tag value. In case of tags with text values, you can choose whether the value should be given precisely or contain a given string. In case of tags with number / date values, you can select a numerical comparison operator.
3. *Specify the tag value.* There are 3 ways of specifying the value of the search criteria:
 - a. *Value* - allows to choose a value from the list of all available values.
 - b. *User value* - allows to type any value; this is particularly useful in case of the *contain* conditions.
 - c. *Value between* - allows to specify the range of the tag value, if the *between* condition has been selected in step 2.
4. *Select the logical operator.* If there already is a search criteria in the current query, you need to decide about the logical relation between the new and the already existent criteria.

Note: The new criteria is only added at the end of the query with AND or OR; to create a more complex logical structure, you need to edit the text form of the query in the *Search query* field.
5. Press the *Add search criteria* button.

The query is also displayed in text form in the *Search query* field. You can modify the query simply editing the text in this field:

- adding search criteria in the form:
"<Tag category name>" <condition> "<Tag value>"
- adding logical operators: OR / AND
- adding brackets.

Note: Manually adding brackets to the search query text is the only way to build a logically more complex search query.

Using the search results

You can use the results of the search in two ways:

- Clicking twice on a position in the *Search results* list will select it in the *Project Browser* and close the *Data search* dialog box. You can then work with the file using the *Project Browser*.
- Clicking on a position in the *Search results* list with the right mouse button will open a pulldown menu, containing various options, depending on the type of the result (*Project Object / Project View*). The menus work in an analogous way to those described in Chapter 10.2.: *Using the Project Browser*.

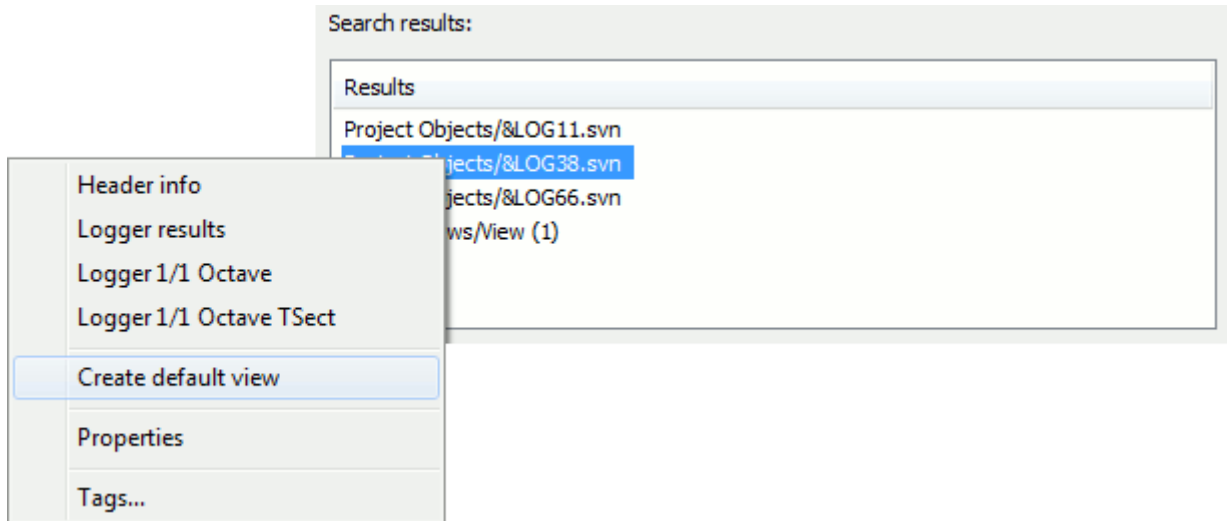


Fig.10.23. Using the *Search results*.

When you open a view from the results of a search, the *Data search* dialog box will automatically be closed.

INDEX

- .svn file 17
- activation code 76
- active function..... 22, 24, 27
- audio events 41-43, 66-67
- block 25-26, 48-52, 55, 75
- calculated results 56-58
- calculator.....36, 45, 54-58, 73
- CSV format 63-65, 72
- data transfer 7-9
- decimal point 64, 65
- installation 4-5
- LEQ.....45, 54-55
- limit time domain.....21-22, 40
- logger results 8, 19, 32-34
- main toolbar.....19, 21, 31, 71-74
- marker 21, 40, 45, 47-52
- merging files 8-9, 32
- MS Excel.....59-60, 73
- MS Word.....61-62, 73
- multifile..... 8-9, 17, 36
- playback..... 41-44, 67
- plot 19, 22-26, 31, 38, 40, 43, 46, 48, 53, 57, 61, 73, 75
- real time clock 8, 16
- RMS..... 45, 54-55
- RS232.....6
- scale 23-24, 26-28
- setup file 9-14, 16, 17
- shortcut keys 75
- spectrogram 19, 26-28, 31, 73
- spectrum 32-36, 45, 53-54, 56
- statistics..... 19, 34-35
- table 19-22, 31, 40, 43, 46, 48, 49, 52, 59, 61, 69, 73
- text 13, 14, 19, 21, 28-29, 31, 40, 61, 69, 70, 73
- USB 3, 4, 6, 74
- view configurator..... 39-40, 56-57, 73